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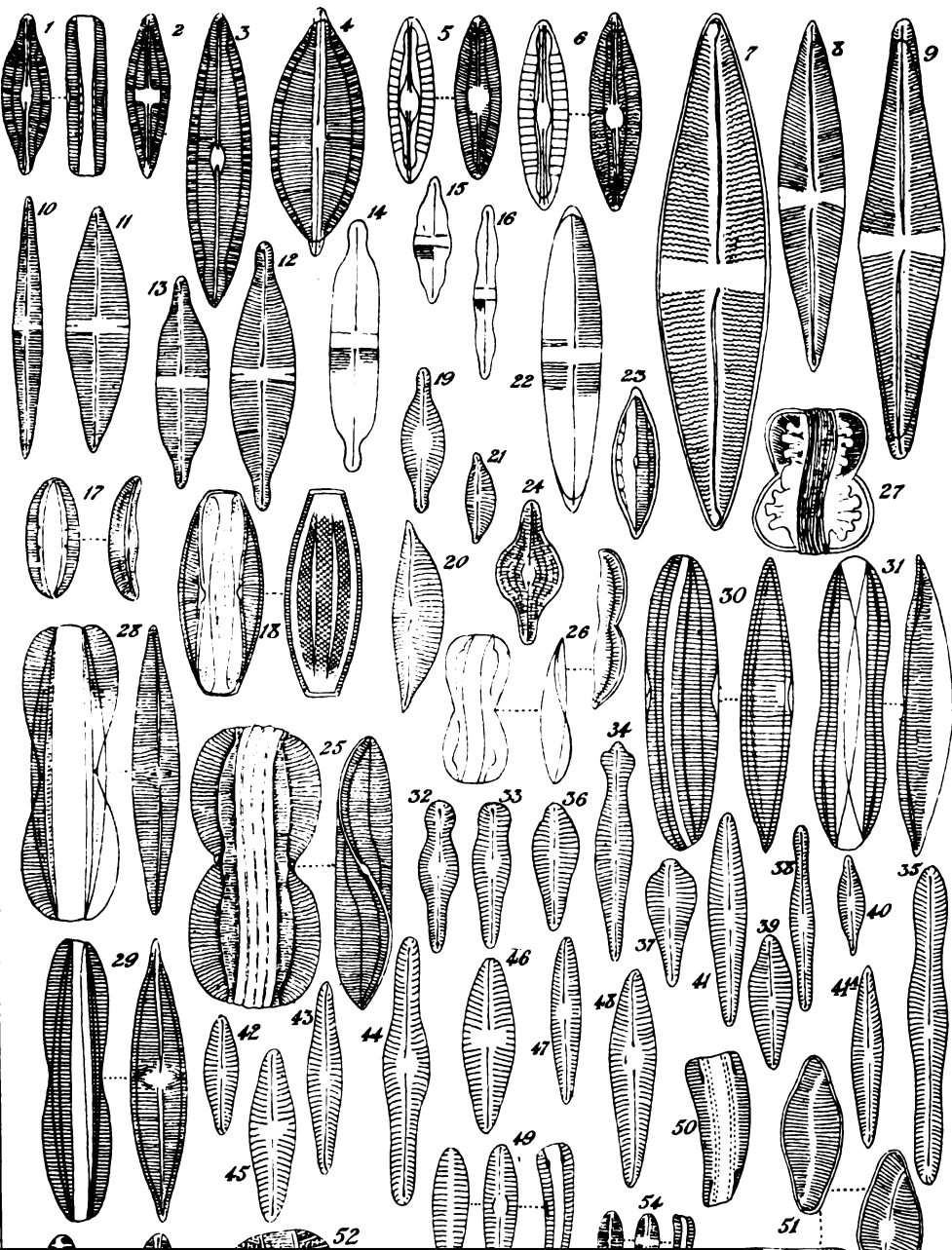
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The Diatomaceae of the Hull district

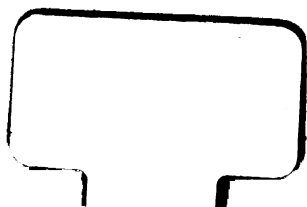
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W. G. FARLOW



THE DIATOMACEÆ

OF THE

HULL DISTRICT.

With Illustrations of 600 Species.

BY
F. W. MILLS, F.R.M.S., AND R. H. PHILIP.

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THE DIATOMACEÆ OF THE HULL DISTRICT.

By F. W. MILLS, F.R.M.S., AND R. H. PHILIP.

INTRODUCTORY NOTE.

THE valuable list of Diatoms of the Hull District, published by the late Geo. Norman, in 1859, of which a revised and extended list was issued in 1865, proved of such use to students of these fascinating microscopic plants, that it has been referred to and quoted from by many later writers on the subject. But since that time the study of Diatoms has made extensive strides, and it has been found necessary to largely revise the nomenclature, in view of fresh light from the work of many observers. In consequence of this, Norman's list is, as far as the names are concerned, fast becoming obsolete, and to the compilers of the present list it seemed desirable to thoroughly revise his records and bring his nomenclature up to date.

In addition to this, many fresh species have been noted in the district, which are here included.

Most of the illustrations have been drawn from the figures contained in Smith's "Synopsis of the British Diatomaceæ," Schmidt's "Atlas der Diatomaceenkunde," Van Heurck's "Synopsis des Diatomées de Belgique," Peragallo's "Diatomées Marines de France," and "Monographie du

genre de Pleurosigma," the plates of Diatoms published in the "Quarterly Journal of Microscopical Science," and in a minor degree from about 30 other works. Some of the figures have been drawn specially for this paper, as the species they represent had not been previously satisfactorily delineated. In all cases every published figure of the species included has been examined, and also the collection of photographs from original types by Dr. Maddox and others which are either in our possession or were accessible to us. No time has been spared in our endeavour to render this list of Diatoms as complete as possible, and the plates as good as the space at our command would allow. They contain a few forms which we have decided to omit from the list, the evidence of their occurrence in the district being, in our opinion, insufficient. These forms are marked † in the keys to the plates.

In revising the nomenclature, we have, in the main, followed the classification given by Van Heurck, as his work is one of the most recent, and perhaps the most popular and well known to students of the Diatomaceæ. We have however, ventured to diverge from his leading in some few particulars. For instance, we considered that the genera *Pinnularia*, included by Van Heurck in *Navicula*, also *Triceratium* and *Amphitetras* which he includes with *Biddulphia*, were better known under their older names. Many of the species recorded as *Pinnularia* by Norman are however more correctly placed among *Navicula*, and we have accordingly referred them to that genus.

It will be observed that a considerable number of forms recorded by Norman as distinct species have, by more or less general consent of later writers, been reduced to the status of varieties. In this connection we wish it to be clearly understood that we do not claim the rank of true species, or even varieties for every form that we list as such; but merely that the specific or varietal name is useful for designating certain forms familiar to diatomists. The boundary line between species and varieties is too vague and uncertain to admit of closer definition than this.

Not to overload the list with a plethora of synonyms, we have used in each case, the name which, in our opinion, is the most generally accepted now, and in those cases in which that name differs from the one used by Norman, we have placed his after it in brackets, ignoring (with a few exceptions) all other synonyms.

We have to acknowledge a few forms in the list on the authority of the "Alga Flora of Yorkshire," by W. West,

F.L.S. and G. S. West, A.R.C.S., which has just appeared. We have, however, rejected a few included by them on the authority of Norman, on one of two grounds; either that having examined Norman's gatherings, we find that he had mis-named the species recorded, or that we do not admit the forms recorded as worthy of specific identification.

In the identification of Norman's records we have been greatly assisted by the kind permission of the authorities of the Hull Municipal Museum to inspect the slides formerly forming his collection and now in their possession.

The comparison of these slides with present day gatherings leads to some noteworthy considerations. The first is perhaps the great industry and patience of Norman and his contemporary microscopists, as evidenced by the number of localities they have examined and the exhaustive lists from each place. The next most striking fact is the remarkable fixity of certain species in certain localities. Half a century has rolled away since Norman and Harrison made their records, but still the springs of Newbald yield *Melosira arenaria*, and those of Haltemprice, *Fragillaria Harrisonii*,—in each case the only localities in this district where these forms are found in quantity. And now, as in those days, all Humber gatherings still contain *Pleurosigma angulatum*, *Amphiprora alata* and *Nitzschia sigma* with its varieties. Side by side with these we find other cases, illustrative of the apparently capricious appearance and disappearance of certain species which every diatomist must have experienced. For instance, in the Wold springs of Newbald and Weedley, *Diatoma hyemale* is now a fairly common form, but it is not recorded by Norman and we fail to find it in any of his slides, though he has made many preparations from localities where it may be found to-day. A converse case of disappearance is shown in Norman's "*Amphiprora constricta*," which, after considerable hesitation and research of authorities we make out to be *Stauroneis amphoroides* Grun, though it is not exactly typical. This seems to have been not uncommon in Norman's time in the docks of Hull and Grimsby, but we have failed to find it now in those localities. *Navicula peregrina* and *N. digito-radiata* var *Cyprinus*, common in most of Norman's slides of brackish water forms, are much scarcer now. Many of our new records are from the brackish waters from the Hull and Humber, such as *Aulacodiscus Sollittianus* and *Campylodiscus clypeus*, but these are not at all plentiful, so it is not necessary to suppose that they are fresh arrivals, but merely that Norman did not happen to light on them.

As regards the extent of country to be considered as the "Hull District," we have followed Norman in not confining ourselves too closely to the immediate neighbourhood of the City. His records comprise gatherings from places, in a few cases, as far distant as Harrogate and Whitby. Speaking generally, we have assumed any place to be in the district that is within reach of a half-day excursion from Hull. The only species we have omitted from his list are those he records on ships' bottoms from foreign parts, as these cannot fairly be considered local. Early in our work, the question arose as to whether we should be justified in including species which Norman found only in the stomachs of Ascidian Molluscs, adhering to oyster shells bought in the Hull market, but the evidence being conclusive that these were dredged up from the North Sea, and the fact that we have found many of these Ascidian species on the shores of the Yorkshire coast and in the Humber estuary, renders it pretty certain that the whole of them may be found, after more numerous observations, within our limits. Norman regretted not having been able to make many gatherings from the sands of the sea shore, and unfortunately we have to express the same regret. The conditions under which gatherings may be made from marine sands are so fugitive that opportunities of making them are exceedingly scarce.

Our material from the North Sea is somewhat scanty. It consists merely of a few Ascidian gatherings examined by Norman, some plankton diatoms on the authority of Prof. T. P. Cleve, and a deep sea sounding. There is therefore a wide field for the labours of our members who are fond of the sea. A careful perusal of Prof. Cleve's works on the plankton of the North Sea and neighbouring waters will afford much valuable information as to the seasonal distribution of the numerous diatoms inhabiting them. We have, however, only thought it desirable to record the forms found by him in a gathering taken near the Yorkshire coast at long. $0^{\circ} 5' W.$, lat. $55^{\circ} 20'$. The diatoms from this gathering are identified in the following list thus:—(Cl.).

The plankton diatoms are of great interest and teach us much about oceanic currents. The neritic (litoral) forms are in many cases varieties of the oceanic, and pass suddenly from one to the other—e.g., *Rhisosolenia alata* becomes changed into *R. gracillima*, and it is not an uncommon occurrence to find a specimen one half of which is typical of *R. alata* and the other half of *R. gracillima*. Again, the northern varieties on inhabiting more temperate waters change their appearance,

as *Coscinodiscus oculus iridis* of the Arctic Ocean becomes *C. concinnus* of the North Sea.

Norman's first list comprised about 400 species, and was then the longest local list that had ever been published. The revised edition of 1865 contained about 480 species. The present list comprises about 600 species and varieties, and we think it is worthy of notice that this is about one half of the species known to be inhabitants of Great Britain and Ireland. Notwithstanding this we do not regard the list as anything like complete, but feel sure that with further research many species hitherto unrecorded will be found, and we should welcome communications from observers who have obtained such forms. These will be inserted in future issues of the Club's Transactions.

[For the very excellent drawings of diatoms on the accompanying plates, as well as the plates themselves, the Club is greatly indebted to Mr. Mills.—Ed.]

ABBREVIATIONS FOR LOCALITIES.

Asc.	= In Ascidian Molluscs.	Mft.	= Marfleet.
Ask.	= Askern.	MCh.	= Marsh Chapel.
Atk.	= Atwick.	MWn.	= Market Weighton.
Brw.	= Barrow on Humber.	Net.	= Nettleton.
Btn.	= Barton on Humber.	Nbd.	= Newbald.
Bnm.	= Benningholme.	NHd.	= New Holland.
Bvy.	= Beverley.	Nld.	= Newland.
Btm.	= Brantingham.	Nsm.	= Newsholme.
Brd.	= Bridlington.	Pfn.	= Pulfin.
Bro.	= Brock o' Dale.	RiC.	= Riccal Common.
Bft.	= Broomfleet.	RFy.	= River Foulney.
Brh.	= Brough.	RHl.	= " Hull.
Cle.	= Cleethorpes.	RHr.	= " Humber.
ClM.	= Cliff Moor.	RAb.	= Roche Abbey.
Cot.	= Cottingham.	Run.	= Runswick.
Cus.	= Cusworth.	ScC.	= Scotter Common.
Dcs.	= Dairycoates.	SkC.	= Skipwith Common.
Don.	= Doncaster.	SFy.	= South Ferriby.
Dfd.	= Driffield.	Slr.	= Saltersgate.
Dun.	= Dunswell.	Skl.	= Skirlaugh.
Elr.	= Ellerker.	Spd.	= Springhead.
Elm.	= Elmswell.	Spn.	= Spurn Point.
EvP.	= Everingham Park.	Stl.	= Stallingbro'.
Fla.	= Flambro'.	Sty.	= Stoneferry.
Gan.	= Ganstead.	Str.	= Strensall.
Gby.	= Grimsby.	Stn.	= Sutton-on-Hull.
Htp.	= Haltemprice.	Tty.	= Tetney.
Har.	= Harrogate.	Tic.	= Tickton.
Hfd.	= Hatfield Moor.	Tol.	= Tollington Moor.
Hes.	= Hessle.	VD.	= Victoria Dock, Hull.
Hin.	= Hinderwell.	WD.	= West Dock, Hull.
Hsa.	= Hornsea.	Wne.	= Wawne.
HmP.	= Hotham Park.	Wee.	= Weedley.
HWW.	= Hull Waterworks.	Wtn.	= Welton.
Ing.	= Inglemire Lane.	Why.	= Whitby.
KHl.	= Kelsey Hill.	Wsa.	= Withernsea.
Key.	= Keyingham.	Wil.	= Willerby.
Kil.	= Killinghall.	Wre.	= Wressle.

bp. = brickpond. c. = canal. dr. = drain. ss. = springs.
tp. = timberpond.

RECORDERS :—

Cl. = Cleve. C. = Coombe. H. = Harrison. Hu. = Hunter. Mi. = Mills.
Mu. = Munroe. N. = Norman. P. = Philip. S. = Stiles. VH. = Van
Heurck. W. = West.

SUB-FAMILY. RAPHDIEÆ.

TRIBE CYMBELLEÆ.

[Species not recorded in Norman's List are marked *.]

- Amphora ovalis*, Kutz., common in all fresh waters; **pl. 12, f. 1.**
- „ „ var. *gracilis*, Btn. & Nbd. ss. (P.); **pl. 12, f. 36*.**
- „ „ „ *affinis* Kutz., HmP. Dun. (P.), Elr. (S.); **pl. 12, f. 2*.**
- „ „ „ *pediculus* (A. minutissima, WSm.), Cot. Bvy. Nbd. ss. (N.), HmP. RFy. Arram, Gan. (P.), RAb. (C.), Bvy. (W.), Hfd. (S.); **pl. 12, f. 3.**
- „ *Normanii*, Rab., on wall in orchid house (N.); **pl. 12, f. 4.**
- „ *Proteus*, Greg., RHr. (Mi.); **pl. 12, f. 37*.**
- „ *arenaria*, Donk., Hsa. sands (N.), Spn. (P.); **pl. 12, f. 5.**
- „ *angusta*, Greg., Brd. sands (P.); **pl. 12, f. 6*.**
- „ *crassa*, Greg., Asc. (N.), RHr. SFy. Paull, Cle. (P.); **pl. 12, f. 7.**
- „ Tty. (N.), SFy. (P.), RHr. (Mi.); **pl. 12, f. 8.**
- „ *salina*, WSm., VD. tp. Rhl. Sty. (N.), RHr. SFy. (P.); **pl. 12, f. 10.**
- „ *costata*, WSm., behind Garrison, Hull (Mu.), RHr. (Mi.); **pl. 12, f. 11.**
- „ *coffeaeformis*, Kutz., Brd. sands (P.); **pl. 12, f. 9*.**
- „ *veneta*, Kutz., Btn. ss. (Mi.); **pl. 13, f. 17*.**
- „ *lineolata*, Ehr. (A. tenera, WSm.), RHr. Sty. (N.), Paull, Rhl. (P.); **pl. 12, f. 12.**
- „ *commutata*, Grun., (A. *affinis*, WSm.), Sty. RHr.
- „ *hyalina*, Kutz., RHr. Gby. (N.), Goole (Hu.); **pl. 12, f. 13.**
- „ *ostrearia*, Breb. (A. *litoralis*, Donk.). Hsa. sands (N.), RAb. (Hu.); **pl. 12, f. 14.**
- „ „ var. *quadrata* (A. *quadrata*, Breb.), Asc. (N.); **pl. 12, f. 15.**
- „ *fusca*, A.S., RHr. (Mi.); **pl. 13, f. 18*.**
- Cymbella Ehrenbergii*, Kutz., Hsa. peat, Cot. (N.), Brd. peat (John Phillips), Nbd. ss. (P.), Ask. (S.); **pl. 12, f. 16.**

- Cymbella cuspidata*, Kutz., Sl. Cot. (N.), RFy. Nbd. ss. (P.), Ask. (S.); pl. 12, f. 17.
- „ *cuspidata*, var. *naviculiformis*, Khl. Pfn. bog (P.), Elr. (S.), Hfd. (C.); pl. 13, 19*.
- „ *amphicephala*, Naeg., Cot. Brh. CIM. (N.), Atk. MWn. Btm. (P.); pl. 12, f. 18.
- „ *obtusata*, Greg., Brh. ss. (N.); pl. 12, f. 19.
- „ *affinis*, Kutz., Har. (N.), Brh. (S.); pl. 12, f. 20.
- „ *microcephala*, Grun., Fla. cliffs (P.); pl. 12, f. 21*.
- „ *aequalis*, WSm. (*Navicula angustata*, WSm., N. *inaequilatera*, Lag.), Thorne moor, ScC. Cot. (N.), Ask. (S.), Brd. (P.), Meaux, Wne. Bvy. (W.); pl. 12, f. 22.
- „ *gastroides*, Kutz., Cave, EvP. Nbd. ss. (P.), Hfd. (S.); pl. 12, f. 23*.
- „ *lanceolata*, Ehr.† (*Cocconema lanceolatum*, Ehr.), Rhl. Nbd. Risby, Dfd. (N.), Arram, Khl. Gby. park (P.), Rhr. (Mi.); pl. 12, f. 24.
- „ „ var. *cornuta*, HWW. (N.); pl. 12, f. 25.
- „ *cymbiformis*, Ehr. (*Cocconema cymbiforme*, Ehr.), common in fresh water; pl. 12, f. 26.
- „ „ var. *parva* (*Cocconema parvum*, WSm.), Anlaby Rd. (Mu.); pl. 12, f. 27.
- „ *Cistula*, Hempr. (*Cocconema Cistula*, Ehr.), common in fresh water; pl. 12, f. 28.
- „ „ var. *maculata*,† Dfd. Fla. Hes. (P.); pl. 12, f. 29*.
- „ *Helvetica*, Kutz., Sl. MWn. c. Spring ditch (N.), Khl. Spd. (P.); pl. 12, f. 30.
- Encyonema prostratum*, Ralfs., Rhl. Wne. (N.), HWW. (Mi.), Nld. (Mu.), Arram (P.), Rab. (C.); pl. 12, f. 31.
- „ *turgidum* (Greg.), Grun., Spring ditch (Mi.), Skidby dr. (P.); pl. 13, f. 20*.
- „ *caespitosum*, Kutz., common; pl. 12, f. 32.
- „ „ var. *Auerswaldii*, Rhr. (Mi.), Gby. park (P.); pl. 13, f. 21*.
- „ *ventricosum*, Kutz. (*Cymbella ventricosa*, Kutz.), Skl. Bnm. Ing. (N.), Cot. Btm. Wtn. ss. (P.), Stn. Bvy. (W.); pl. 12, f. 33.

† Hunter records *Cocconema Boeckii* (WSm. sic.) Grun. for Goole. This is a variety of *Cymbella lanceolata*, which we illustrate (after Grunow in A.S. Atl., Pl. 10, fig. 11), in our Pl. 26, fig. 17.

‡ The form recorded by Norman, as *Cymbella maculata*, on examination of his slides proves to be *Encyonema caespitosum*, no doubt found without tubes.

- Encyonema gracile*, Rab., KHL. (P.); pl. 12, f. 34*.
 „ „ var. *Scotica* (*Cymbella Scotica*, WSm.),
 Slt. Cot. Rd. (N.), KHL. (P.);
 pl. 12, f. 35.

TRIBE NAVICULEÆ.

- Mastogloia Smithii*, Thw., Stl. RHr. Sty. (N.); pl. 13, f. 1.
 „ „ var. *lacustris*, EvP. KHL. (P.); pl. 13,
 f. 2*.
 „ *lanceolata*, Thw., VD. tp. (H.), Cle. (N.), HmP.
 MWn. bog (Mi.); pl. 13, f. 3.
 „ *apiculata*, WSm., VD. tp. (H.); pl. 13, f. 4.
 „ *Danseii*, Thw., Hsa. mere, Brh. Bft. (N.);
 pl. 13, f. 5.
 „ *Grevillei*, WSm., Hsa. peat (N.); pl. 13, f. 6.
 „ *Gallica*, WSm. (*Diadismis Gallica*), Water tank,
 Hull (H.); pl. 18, f. 20.
Stauroneis Phenicenteron, Ehr., Net. Cot. MWn. c. Risby (N.),
 Hsa. mere, Elm. (P.), Tic. (W.), Hfd. (S.);
 pl. 13, f. 7.
 „ *gracilis*, Ehr., Net. Htp. RHr. (N.), Hsa. mere
 (P.), Brw. ss. (Mi.); pl. 13, f. 8.
 „ *acuta*, WSm., Risby, Hsa. peat (N.), Nbd. ss. (P.);
 pl. 13, f. 9.
 „ *Gregorii*, Ralfs., RHr. Mft. (Mi.), Cle. (P.); pl. 13,
 f. 22*.
 „ *spicula*, Hickie., Hes. creek (P.), RHr. (Mi.);
 pl. 18, f. 10*.
 „ *salina*, WSm., Sty. Stl. MCh. Tty. (N.), Paull,
 WD. (P.); pl. 13, f. 11.
 „ *anceps*, Ehr., Cot. Bvy. Wne. Htp. (N.), HmP.
 Hes. (P.), Routh (W.), Hfd. (S.); pl. 13,
 f. 12.
 „ „ var. *linearis* (*S. linearis*, Kutz.), CIM. (N.),
 Hes. creek (P.); pl. 13, f. 13.
 „ „ var. *amphicephala* (*S. amphicephala*, Kutz.),
 Mtn. peat (N.); pl. 13, f. 14.
 „ *Smithii*, Grun. (*S. linearis*, WSm.), Kil. Bvy. Cot.
 MWn. c. (N.), Dfd. Swine (P.), Elr. (S.);
 pl. 13, f. 15.
 „ *Legumen*, Ehr., ScC. (N.), Cot. (P.), Bvy. (W.);
 pl. 13, f. 16.
 „ *amphoroides*, Grun. (*Amphiprora constricta*, Ehr.),
 VD tp. Mft. (N.); pl. 26, f. 7.

- Pinnularia nobilis*, Ehr., Cot. (N.), Arram dr. (P.), Hsa. peat (Mi.), Bvy. (W.); pl. 16, f. 1.
- „ *major*, Kutz., Hsa. peat, MWn. c. (N.), Cave, Arram, Hsa. mere (P.), Hfd. (S.); pl. 16, f. 2.
- „ *viridis*, Kutz., common in fresh water; pl. 16, f. 3.
- „ „ *var. commutata* (P. hemiptera, WSm.), Slt. (N.), Hsa. mere (P.); pl. 16, f. 4.
- „ *hemiptera*, Kutz. (P. acuminata, WSm.), Scarbro. (W.); pl. 27, f. 2*.
- „ *cardinalis*, Ehr., Hsa. and Marton peat (N.); pl. 16, f. 5.
- „ *gracillima*, Greg., Slt. (N.); pl. 16, f. 6.
- „ *undulata*, Greg., ScC. (N.); pl. 16, f. 7.
- „ *lata*, Breb., Scarbro' (W.); pl. 27, f. 1.
- „ *borealis*, Ehr., Bnm. MWn. c. (N.), Sculcoates lane (P.); pl. 16, f. 8.
- „ *divergens*, WSm. (N. legumen, Ehr.), Cot. (N.), Don. (S.); pl. 16, f. 9.
- „ *retusa*, Breb. Asc. Fla. dredgings (N.); pl. 16, f. 10.
- „ *Brebissonii*, Kutz. (P. stauroneiformis WSm.), Skl. Net. Cot. (N.), Nld. bp., Swine, Run. (P.), Tic. Bvy. Meaux (W.); pl. 16, f. 11.
- „ *stauroptera* (Grun.), *var. parva*, Endyke lane (P.); pl. 16, f. 12*.
- „ *tabellaria*, Ehr., Slt. (N.); pl. 16, f. 13.
- „ *gibba*, Kutz., Slt. Risby. Cot. Htp. (N.); pl. 16, f. 14.
- „ *subcapitata*, Greg., ScC. CIM. (N.); pl. 16, f. 15.
- „ *appendiculata*, Ag., on rocks, Why. (N.), Nsm. (W.); pl. 17, f. 4.
- „ *globiceps*, Greg., Mft. dr. (N.); pl. 16, f. 16.
- „ *mesolepta*, Ehr., Slt. Htp. Bvy. Hsa. peat (N.), Hes. MWn. (P.), SFy. (Mi.); pl. 16, f. 17.
- „ *interrupta*, WSm., Net. Wne. Har. (N.); pl. 16, f. 20.
- „ *nodosa*, Ehr., ScC. CIM. Marton peat, Tol. (N.); pl. 16, f. 18.
- „ *nodosa*, *var. formica* (P. polyonca, Breb.), Pond in Net. Wood (N.); pl. 16, f. 19.
- „ *claviculus*, Greg., Marton Peat (N.); pl. 16, f. 21.

GENUS NAVICULA.

RADIOSAE.

- Navicula oblonga*, Kutz. (*Pinnularia oblonga*, WSm.), Cot. Skl. Hsa. peat (N.), KHI. Pfn. Dun. (P.), Hfd. Cus. (S.); pl. 16, f. 22.

- Navicula peregrina*, Kutz. (Pinn. *peregrina*, Ehr.), Sty. Tty. ditch nr. RHl. (N.), SFy. Key. dr. (P.), RHr. (Mi.), Hfd. (S.), Tic. (W.); pl. 16, f. 23.
- „ *peregrina*, var. *Menisculus* Schum., Brw. ss. Pfn. bog (P.); pl. 17, f. 5*.
- „ *cincta* (Ehr.) Kutz. (Pinn. *cincta*, Ehr.), HWW. (N.), Brh. (P.); pl. 17, f. 6.
- „ *gracilis*, Ehr. (Pinn. *gracilis*), Mft. RHr. Tty. Slt. (N.), Paull (P.), RAb (C.), Ask (S.); pl. 16, f. 24.
- „ „ var. *schizonemoides*, V. H. (*Colletonema neglectum*, Thw.), RHl, Wne, HWW. Brh. (N.), Btm. (P.), RAb (C.); pl. 16, f. 25.
- „ *viridula*, Kutz. (Pinn. *viridula*, WSm.), Wne. Kil. Cot. (N.), Elm. ss. Stn. dr. (P.), RHr. (Mi.), Cus. Ask. (S.); pl. 16, f. 26.
- „ „ var. *Slesvicensis*, Sty. (VH.), Nld. Elr. (P.); pl. 16, f. 27*.
- „ *radiosa*, Kutz. (Pinn. *radiosa*, WSm., Pinn. *acuta*, WSm.), common; pl. 16, f. 28.
- „ „ var. *tenella*. (Pinn. *varians* var. *tenella* Greg.), Brh. Wsa. (N.); pl. 16, f. 29.
- „ *cryptocephala*, Kutz., common in brackish water; pl. 16, f. 30.
- „ „ var. *exilis*, Ing. (P.); pl. 26, f. 3*.
- „ „ „ *veneta*, Nsm. (W.), RAb. (C.); pl. 26, f. 19*.
- „ *rhyncocephala*, Kutz., Cot. Risby, Har. Htp. Mwn. c. (N.), Gby. Sty. Rd. (P.), Bvy. Wne. Meaux (W.); pl. 16, f. 31.
- „ *rhyncocephala*, var. *rostellata* (Pinn. *garganica*, WSm.), Cot. Har. RHl. (N.), RHr. (Mi.), NHd. (P.); pl. 17, f. 7.
- „ *gregaria*, Donk., Ing. (P.); pl. 16, f. 32*.
- „ *Hungarica*, Grun. (Pinn. *pygmaea* Ehr.), RHl. Cot. Sty. (N.); pl. 17, f. 8.
- „ „ var. *capitata* (Pinn. *inflata*, Kutz. N. *humilis*, Donk.), Wne. Kil. MWn. Bvy. (N.), Nld. bp. Dun. (P.), Elr. (S.), RAb. (C.), Tic. (W.); pl. 16, f. 33.
- „ *nana*, Greg. (Pinn. *nana*), Cot. Sty. (N.), RFy. Swine (P.); pl. 16, f. 34.
- „ *cancellata*, Donk., Brd. Sands (P.); pl. 16, f. 35*.

- Navicula crucifera*, Grun. (*N. apiculata*, Breb.), Asc. (N.);
 pl. 16, f. 48.
- „ *fortis*, Greg., Brd. Sands (P.), RHr. (Mi.);
 pl. 16, f. 36*.
- „ *digito-radiata*, var. *Cyprinus*, WSm. (*Pinn. Cyprinus*), Dcs. Tty. MCh. Gby. (N.),
 Cle. (P.); pl. 16, f. 37.
- „ *Reinhardtii*, Grun., Nld. bp. (P.), Hfd. (S.);
 pl. 16, f. 38*.
- „ *distans* (WSm.), V. H. (*Pinn. distans*, WSm.),
 Hsa. sands, Fla. dredgings, Asc. (N), Fla.
 rocks, Cle. (P.); pl. 16, f. 39.
- „ *arenaria*, Donk., Brd. sands (P.); pl. 16, f. 40*.
- „ *lanceolata*, Kutz., Bvy. (N.), Htp. Nld. bp. (P.);
 pl. 16, f. 41.
- „ *Gastrum* (Ehr.) Donk. (*Pinn. varians*, Greg., *N. rostellum*, WSm.), Cot. Htp. Stl. Ing.
 (N.), Run. Brh. Pfn. (P.); pl. 16, f. 42.
- „ „ var. *exigua* (*Pinn. exigua*, Greg.), Sty.
 (N.); pl. 16, f. 43.
- „ *Anglica*, Ralfs. (*N. tumida*, WSm.), Cot. (N.),
 Rab. (S.), Wre. (W.), Key. Gan. (P.);
 pl. 16, f. 44.
- „ „ var. *subsalina*, RFy. (P.); pl. 16, f. 45*.
- „ *semen*, Ehr., Hsa. peat, Cot. Risby (N.), Hfd. (S.);
 pl. 16, f. 46.
- „ *dicephala*, WSm., Htp. (N.), MWn. (Mi.), Run.
 Bro. (P.), Meaux. Wne. (W.), Don. (S.);
 pl. 16, f. 47.
- „ *directa*, WSm. (*Pinn. directa*), Gby. (N.); pl. 16,
 f. 49.

DIDYMAE.

- Navicula Crabro*, var. *Pandura* Breb., Asc. (N.); pl. 16, f. 50.
- „ *interrupta*, Kutz., RHr. (Mi.), Cle. (P.); pl. 17, f. 9*.
- „ *didyma*, Ehr., Sty. MCh. Gby. (N.), RHr. (Mi.);
 pl. 16, f. 51.
- „ *Bombus*, Ehr., Asc. (N.), Cle. (P.); pl. 16, f. 52.

ELLIPTICAE.

- Navicula Smithii*, Breb., ditch nr. RHl. Asc. (N.), NHd. Cle.
 (P.), Fla. (Mi.); pl. 17, f. 1.
- „ „ var. *aestiva* (*N. aestiva* Donk), Hsa. sands
 (N.); pl. 17, f. 2.

- Navicula litoralis*, Donk., Brd. sands (P.) ; pl. 16, f. 53*.
 „ *nitescens*, Greg., Asc. (N.) ; pl. 17, f. 10.
 „ *fusca*, Greg., Asc. (N.) ; pl. 17, f. 11.
 „ *suborbicularis*, Greg., RHr. (Mi.) ; pl. 17, f. 12*.
 „ „ var. *coffeaformis* A. S. RHr. (Mi.) ;
 pl. 17, f. 13*.
 „ *elliptica*, Kutz., Hsa. peat, Htp. Nbd. RHl. MWn. c.
 Cot. (N.), HmP. Wee. (P.) ; pl. 17, f. 3.
 „ „ var. *ovalis*, Swine (P.), Cus. Don. (S.) ;
 pl. 17, f. 3a*.
 „ „ var. *oblongella*. A slide of Norman's
 labelled *N. ellipsis* WSm. from VD. piers, contains
 this and the preceding variety with intermediate
 forms ; pl. 26, f. 4.

LYRATAE.

- Navicula Lyra*, Ehr., Fla. dredgings, Asc. (N.), Cle. (P.) ;
 pl. 17, f. 14.
 „ „ var. *elliptica*, RHr. (Mi.) ; pl. 17, f. 15*.
 „ *forcipata*, Grev., Asc. (N.), Cle. (P.) ; pl. 17, f. 16.
 „ *pygmaea*, Kutz. (*N. minutula* WSm.), Sty. MCh.
 Tty. (N.), SFy, RHl. Hes. (P.) ; pl. 17, f. 17.

HENNEDYEAE.

- Navicula Hennedyii*, WSm., Asc. (N.) ; pl. 17, f. 18.

ASPERAE.

- Navicula aspera*, Ehr. (*Stauroneis pulchella* WSm.), Hsa. sands,
 Fla. dredgings, Asc. (N.), RHr. (Mi.), Cle. (P.) ;
 pl. 17, f. 19.

STAURONEIDEAE.

- Navicula Tuscula*, Ehr. (*Stauroneis punctata*, Kutz.), ScC. Hsa.
 & Wsa. peat (N.), RHl. Pfn. (P.) ; pl. 17, f. 20.
 „ *mutica*, Kutz., Posts in river, Dcs. (N.), Hull dock
 (P.) ; pl. 17, f. 21.
 „ „ var. *undulata* (*Stauroneis undulata* Greg.)
 RHl. Cot. CIM. (N.) ; pl. 17, f. 22.
 „ „ var. *quinenodis* (*N. undosa* Donk) Cot.
 (N.) ; pl. 17, f. 23.
 „ *crucicula*, Donk. (*Stauroneis dilatata*, WSm.), Sty.
 Tty. (N.) ; pl. 18, f. 22.
 „ *integra*, WSm. (*Pinn, integra*) Brh. (N.) ; pl. 17, f. 25.

PALPEBRALES.

- Navicula palpebralis*, Breb., South bank, RHr. (Mu.); pl. 17, f. 26.
 „ „ var. *Barklayana* Greg., Hsa. sands (N.); pl. 17, f. 27.

ABBREVIATAE.

- Navicula brevis*, Greg., RHr. (Mi.); pl. 17, f. 28*.
 „ *elegans*, WSm., Sty. Tty. (N.), SFy. (P.); pl. 17, f. 29.

PERSTRIATAE.

- Navicula humerosa*, Breb., Hsa. sands Tty. (N.), Brd. sands, Spn. Cle. (P.); pl. 17, f. 30.
 „ *latissima*, Greg., RAb. (Hu.); pl. 26, f. 22*.
 „ *scutelloides*, WSm., Hsa. mere (N.); pl. 17, f. 31.
 „ *granulata*, Breb., Hsa. sands (N.), Spn. (Mi.); pl. 17, f. 32.
 „ *Baileyana*, Grun., RHr. (Mi.), Cle. (P.); pl. 17, f. 33*.
 „ *confervacea*, Kutz. (*Diadsmis*) Ask. (S.); pl. 26, f. 20*.
 „ *pusilla*, WSm., Wne. MWn. c. Sty. Cot. (N.), Nld. bp. (P), RHr. (Mi.), Meaux (W.); pl. 17, f. 34.
 „ *marina*, Ralfs. (N. *punctulata* WSm.) Stl. MCh. (N.), Cle. (P.); pl. 17, f. 35.

JOHNSONIEAE.

- Navicula scopulorum*, Breb. (Pinn. *Johnsoni*, WSm.), VD. (N.), Paull, NHd. Cle (P.); pl. 17, f. 36.

CRASSINERVES.

- Navicula cuspidata*, Kutz., Hsa. mere & peat, Risby, Htp. (N.), Wee ss. Arram dr. Nld. bp. Gan. (P.), Wre. RiC. (W.), Hfd. (S.); pl. 17, f. 37.
 „ „ forma *craticula* (*Surirella craticula* Ehr.) Marton peat (N.); pl. 26, f. 16.
 „ *ambigua*, Ehr., Hsa. & Marton peat, Sty. (N.), Spd. (P.), Str. Wre. (W.); pl. 17, f. 38.
 „ *ambigua* forma *craticula*, V.H., Swine (P.); pl. 17, f. 39*.

FUSIFORMES.

- Navicula fusiformis*, var. *ostrearia* (Gaill) V.H. (*Amphipleura Danica* Kutz) Tty. Gby. RHr. (N.); pl. 17, f. 40.

SCULPTEAE.

- Navicula sculpta*, Ehr. (N. tumens, WSm.), Tty. Sty. (N.),
Hes. SFy. Rhl. (P.), Ask. (S.); pl. 17, f. 41.
 „ *Bohemica*, Ehr., Rhl. nr. Haworth Hall (P.);
pl. 17, f. 42*.
 „ *sphaerophora*, Kutz., Htp. Net. Hsa. peat (N.),
Nld. bp. Hin. (P.), Meaux, Bvy. (W.);
pl. 17, f. 43.

SERIANTEAE.

- Navicula serians*, Breb., ScC. (N.), Hfd. (S.), Str. (W.);
pl. 17, f. 46.
 „ *exilis* (Kutz) Grun., Hfd. (S), Bvy. Wne. Wre.
(W.); pl. 26, f. 18.
 „ *follis*, Ehr. MWn. c. Bvy. (N.), Rhl. Pfn.bend (P.);
pl. 13, f. 24.

FORMOSAE.

- Navicula probabilis*, A.S., RHr. (Mi.); pl. 17, f. 45*.
 „ *latiuscula*, Kutz. (N. patula, WSm.), Hsa. peat (N.),
Hfd. (S.).
 „ *amphisbaena*, Bory., Sty. Net. Cot. MCh. Tty. Har.
Htp. (N.), Arram, Dun. (P.); pl. 18, f. 1.
 „ *amphisbaena*, var. *subsalina*, SFy. Gby. park (P.),
RHr. (Mi.); pl. 18, f. 2*.

LIMOSAE.

- Navicula limosa*, Kutz., Cot. ss. Rhl. Wne. (N.), Pfn. (P.),
Hfd. (S.), Bvy. (W.); pl. 18, f. 3.
 „ „ var. *gibberula* (N. gibberula Kutz.) Risby
Net. Skl. Cot. Hsa. mere Tty. Wne. Htp.
MWn. c. (N.), Pfn. (P.); pl. 18, f. 8.
 „ „ var. *curta*, Hfd. (S.), Bro. (P.); pl. 26, f. 21.

AFFINES.

- Navicula bisulcata* Langst. (N. scita, WSm.), Nbd. and
Cot. ss. (N.); pl. 18, f. 5.
 „ *Iridis*, Ehr. (N. firma Kutz.); Risby, Cot. Htp. (N.),
Nbd. Hin. (P.), Hfd. (S.); pl. 18, f. 6.
 „ „ var. *amphigomphus* Ehr., Cot. Wne. Har.
(N.), Pfn. Btn. ss. (P.), SkC. (W.); pl. 18,
f. 7.

- Navicula Iridis*, var. *amphirhyncus* Ehr., Net. Cot. Skl. Har (N.), Nid. bp. Dun. Gan. (P.), Goole (Hu.) Bvy. (W.), Brd. peat (John Phillips); pl. 18, f. 8.
- „ „ var. *dubia* Ehr., Pfn. bog. Btn. ss. (P.); pl. 18, f. 9*.
- „ „ var. *undulata* Grun., SFy. MWn. (Mi.), Gan. (P.); pl. 18, 10*.
- „ „ var. *affinis* Ehr. (N. *affinis*, N. *producta*), Cot. Htp. ScC. Skl. Hsa. peat (N.), Dun. Gan. (P.), Wre. (W.), RAb. (C.); pl. 18, f. 11.

LINEARES.

- Navicula liber*, WSm., Fla. dredgings (N.), RHr. (Mi.); pl. 18, f. 12.

BACILLEAE.

- Navicula bacillum*, Ehr., Hsa. peat (N.), RHI. Pfn. (P.); pl. 18, f. 13.
- „ *laevis*, Kutz., Slt. Net. Cot. Htp. Hsa. peat, Wne. (N.), Btn. ss. RHr. (P.); pl. 18, f. 14.
- „ *obtusa*, WSm., Cot. ss. (N.); pl. 18, f. 15.
- „ *Pupula*, Kutz., Wre. (W.); pl. 27, f. 3*.

MINUTISSIMAE.

- Navicula incerta*, Grun., Key. dr. (P.); pl. 26, f. 23*.
- „ *atomus*, Naeg., Cot. (N.), Rain puddle, Sculcoates (P.); pl. 18, f. 16.
- „ *cocconeiformis*, Greg., CIM. (N.); pl. 18, f. 17.
- „ *binodis*, (Ehr.) WSm., Bvy parks (N.), RAb. (C.); pl. 18, f. 18.
- „ *lepidula*, Grun., Spring ditch, ScC. (N.); pl. 18, f. 19.
- Schizonema Smithii*, Ag., Hsa. on submerged peat beds (N.); pl. 18, f. 21.
- „ *crucigerum*, WSm., VD. tp. Tty, Gby. (N.), Paull NHd. Cle. (P.); pl. 17, f. 24.
- „ *Grevillei*, Ag. Sandlemere peat, RHr. (N.), Fla. rocks (P.); pl. 18, f. 23.
- „ *ramosissimum*, Ag. MCh. (N.), Mft. (P.); pl. 18, f. 24.
- Colletonema lacustre*, (Ag.), V.H. Hfd. (S.); pl. 26, f. 24*.
- Vanheurckia rhomboides*, Breb. (*Navicula rhomboides* Ehr.) Thorne, ScC. CIM. (N.), Arram (P.), SkC. (Fowler); pl. 18, f. 25.

- Vanheurckia rhomboides*, var. *Saxonica* Rab. (N. *crassinervia* Breb.), Net. Slt. Cot. RHL. (N.), Htp. (P.), Ask. (S.); pl. 18, f. 26.
- „ *vulgaris* (Colletonema Thw.) V.H., Cot. ss. (N.), Stn. dr. Htp. (P.), RAB. (C.); pl. 18, f. 27.
- Amphipleura pellucida*, Kutz., Net. Risby, Ing. (N.), Cot. (H.), Htp. (P.), Hfd. Don. (S.); pl. 18, f. 28.
- Brebissonia Boeckii*, Grun. (*Doryphora Boeckii* WSm.), Why. (N.); pl. 18, f. 29.
- Berkeleya fragilis*, Grev., Dcs. (H.); pl. 18, f. 30.
- „ *obtusata*, Grev. (*Schizonema Dillwynnii* Ag.), VD. tp. RHR. Why. (N.); pl. 18, f. 31.
- Scoliopleura latestriata* (Breb.) Grun., RHR. (Mi.), Cle. (P.); pl. 18, f. 32*.
- „ *tumida* (Breb.) Grun. (*Navicula Jenneri* WSm.), RHR. Stl. RHL. Sty. Mch. Gby. (N.), Cle. WD. (P.), Fla. (Mi.); pl. 18, f. 33.
- „ *Westii* (WSm.), Grun. (*Navicula Westii* WSm.), RHL. Stl. Sand-le-mere, Hollym carrs (N.), Paull, WD. (P.); pl. 18, f. 34.
- Toxonidea insignis*, Donk., Asc. (N.), Brd. sands (P.); pl. 19, f. 31.
- „ *undulata*, Norm., Asc. (N.); pl. 19, f. 32.
- Pleurosigma angulatum*, WSm., outlet Hsa. mere, Sty. Gby. (N.), Cle. Paull, WD. (P.), RHR. (Mi.); pl. 19, f. 1.
- „ *Aestuarii*, WSm., Dcs. RHR. (N.), Mft. Cle. (P.); pl. 19, f. 2.
- „ *quadratum*, WSm., Dcs. (N.), Paull, WD. (P.); pl. 19, f. 3.
- „ *delicatum*, WSm., VD. tp. Sty. (N.); pl. 19, f. 4.
- „ *strigosum*, WSm., Paull, Fla. Gby. Mft. (N.), RHR. (Mi.), NHd. (P.); pl. 19, f. 5.
- „ *rigidum*, WSm., Fla. (N.), RHR. (Mu.); pl. 19, f. 6.
- „ *affine*, var. *Normanni* (P. *Normanni* Ralfs) Asc. (N.); pl. 19, f. 7.
- „ *naviculaceum*, Breb. (P. *transversale* WSm.), Asc. (N.); pl. 26, f. 31.
- „ *intermedium*, WSm., VD. tp. Gby. (N.), NHd. (P.); pl. 19, f. 10.
- „ *intermedium*, var. *nubecula* (P. *nubecula* WSm.), VD. tp. Gby. (N.); pl. 19, f. 11.
- „ *speciosum*, WSm., Gby docks (N.); pl. 18, f. 35.
- „ *elongatum*, WSm., Mft. Hsa. mere outlet, Tty. (N.), Cle. Hes. Key. dr. (P.); pl. 19, f. 12.

- Pleurosigma acutum*, Norm., Asc. (N.) ; pl. 19, f. 13.
 „ *decorum*, WSm., Fla. (N.), Mft. Key. dr. (P.) ;
 pl. 19, f. 14.
 „ *Hippocampus*, WSm., RHr. RHl. Tty. Sty. (N.),
 Key. Mft. Hes. (P.) ; pl. 19, f. 15.
 „ *attenuatum*, WSm., Cot. Net. Risby, Nbd. Wne.
 (N.), Wold ss. (P.), Hsa. peat (Mi.) ; pl. 19,
 f. 16.
 „ *attenuatum*, var. *scalprum* (Gail) Grun. (P.
acuminatum, WSm.), Gby. Stl. (N.), Hfd. (S.) ;
 pl. 19, f. 17.
 „ *litorale*, WSm., Gby. Stl. (N.), RHr. (Mi.), Mft.
 Cle. (P.) ; pl. 19, f. 18.
 „ *Balticum*, WSm., Humber bank (N.), RHr. (Mi.),
 Cle. (P.) ; pl. 19, f. 19.
 „ *Balticum*, var. *Brebissonii* (Cl. & Grun.), V.H.
 (P. *scalprum*, Breb.), Hes. RHl. Gby. Sty.
 (N.), RHr. (Mi.), Mft. (P.) ; pl. 19, f. 20.
 „ *Balticum*, var. *Wansbeckii*, Mft. NHd. Cle. (P.) ;
 pl. 18, f. 36*.
 „ *acuminatum*, (Kutz), Grun. (P. *lacustre*, WSm.),
 Cot. Htp. Risby, Hsa. peat, Bvy. MWn. c.
 (N.), Nld. bp. Gan. Btn. ss. (P.), Hsa. mere,
 Wre. (W.) ; pl. 19, f. 21.
 „ *strigilis*, WSm., Mft. Sty. (N.), Paull, NHd. (P.),
 Brh. (S.) ; pl. 19, f. 22.
 „ *Spencerii*, var. *Smithii*, Grun. Hsa. mere and peat,
 Wne. Risby, Net. Htp. (N.), MWn. Dun.
 (P.), Elr. Hfd. (S.) ; pl. 19, f. 23.
 „ *Spencerii*, var. *curvula*, Grun. Paull (P.) ; pl. 18,
 f. 37*.
 „ *tenuissimum*, WSm., Salt pools Gby. (N.) ; pl.
 19, f. 24.
 „ *Parkerii*, Harrison, Thornton le Moor (N.), Key.
 dr. (P.) ; pl. 19, f. 25.
 „ *distortum*, WSm., Gby. (N.), Mft. NHd. Key. dr.
 (P.) ; pl. 19, f. 26.
 „ *Fasciola*, WSm., RHr. Gby. Sty. Stn. (N.), Key.
 dr. NHd. Bft. Mft. (P.) ; pl. 19, f. 27.
 „ „ var. *prolongatum*, (P. *prolongatum*, WSm.),
 Gby. VD. tp. (N.) ; pl. 19, f. 28.
 „ *macrum*, WSm., Sty. Stn. (N.) ; pl. 26, f. 32.
 „ *eximium*, (Thw.), VH. (*Colletonema eximium*,
 Thw.), Sty. Wne. Outlet Hsa. mere (N.),
 RHl. Hes. Bft. (P.) ; pl. 19, f. 30.

- Pleurosigma scalpoides*, Rab. Hfd. (S.) ; pl. 27, f. 4*.
 „ *lanceolatum*, Donk., Hsa. sands (N.), Brd. sands (P.) ; pl. 19, f. 9.
Amphiprora alata, Kutz., MCh. Hes. Sty. VD. tp. (N.), WD. Cle. (P.), RHr. (Mi.) ; pl. 13, f. 25.
 „ *paludosa*, WSm., Sty. Stn. Hes. RHr. (N.), Paull, KHI. Cle. (P.) ; pl. 13, f. 26.
 „ *ornata*, Bail., Hes. creek (Mi.) ; pl. 13, f. 27*.
Orthotropis lepidoptera (Greg.), Cl. (*Amphiprora lepidoptera*), Fla. dredgings (N.) ; pl. 13, f. 28.
 „ *lepidoptera*, var. *Mediterranea* Grun., RHr. (Mi.) ; pl. 13, f. 29*.
Plagiotropis elegans (WSm.), Grun. RHr. (Mi.) ; pl. 13, f. 30*.
 „ *vitrea* (WSm.), Grun. (*Amphiprora vitrea*), Fla. dredgings (N.), Cle. (P.) ; pl. 13, f. 31.
Auricula complexa (Greg.), Cl., Cle. (P.) ; pl. 27, f. 13*.

TRIBE GOMPHONEMAE.

- Gomphonema constrictum*, Ehr., Skl. Risby, Bvy. Wne. Hsa. peat, Cot. MWn. c. (N.), EvP. Wee. ss. Dun. Arram (P.), Ask. (S.), Wre. (W.) ; pl. 13, f. 32.
 „ *constrictum*, var. *capitatum*, Ehr., Cot. Hsa. peat (N.), Anlaby Rd. (Mu.), EvP. Dun. Htp. (P.), Wre. (W.) ; pl. 13, f. 33.
 „ *acuminatum*, Ehr., Dfd. Nsm. Cot. Wne. Bvy. (N.), Nbd. Elm. Htp. (P.), Ask. (S.) ; pl. 13, f. 34.
 „ „ var. *elongatum*, WSm., Stl. (N.) ; p. 13, f. 35.
 „ „ var. *trigonocephalum*, Cot. Dun. Pfn. bog. (P.) ; pl. 13, f. 36*.
 „ „ *Augur*, Ehr. (*G. cristatum*, Ralfs), Greenhouse tank (N.) ; pl. 13, f. 37.
 „ *subtile*, Ehr., Hsa. peat (N.) ; pl. 13, f. 38.
 „ *montanum*, var. *commutatum*, Nbd. ss. (P.), Ask. Don. (S.) ; pl. 13, f. 39*.
 „ *parvulum*, Kutz., Arram, Btm. brook (P.) ; pl. 13, f. 40*.
 „ *gracile*, Ehr. (*G. dichotomum*, WSm.), Nbd. RHI. MWn. c. (N.), KHI. (P.), Stn. (W.) ; pl. 13, f. 41 & 41a.
 „ *micropus*, Kutz. (*G. tenellum*, WSm.), Sty. Nld. Dfd. Skl. Londesbro. (N.), Key. (P.), Meaux, Bvy. Stn. Nsm. (W.) ; pl. 13, f. 42.

- Gomphonema intricatum*, Kutz., Net. Wne. Derwent, Bnm. (N.), KHL. Btn. ss. Htp. (P.); pl. 13, f. 43.
 „ var. *vibrio* (G. *vibrio*, Ehr.), RHL. Wne. (N.), Ask. (S.); pl. 13, f. 44.
 „ *angustatum*, Kutz., Btm. (P.); pl. 13, f. 45*.
 „ *olivaceum*, Kutz., Bnm. Cot. Beck (N.), Htp. Fla. Cliffs (P.), Ask. (S.), Wre. (W.); pl. 13, f. 46.
 „ *exiguum*, Kutz., VD. (N.); pl. 13, f. 47.
 „ *insigne*, Greg., Nbd. ss. (N.); pl. 13, f. 48.
Rhoicosphenia curvata (Kutz.) Grun., Cot. Har. (N.), KHL. RFy. (P.), RHR. (Mi.), RAb. (C.); pl. 13, f. 49.
 „ *curvata*, var. *marina*, Fla. rocks, Spn. (P.); pl. 13, f. 50*.

TRIBE ACHNANTHEAE.

- Achnanthidium flexellum*, Breb. (Cocconeis *Thwaitesi*, WSm.), Cot. Nbd. ss. (N.), KHL. Hes. (P.), Ask. Cus. (S.); pl. 13, f. 51.
Achnanthes longipes, Ag., MCh. VD. and Gby. tp. (N.), SFy. (P.), RHR. (Mi.); pl. 13, f. 52.
 „ *brevipes*, Ag., VD. tp. Cle. Tty. Sty. (N.). On posts Hsa. Paull (P.), RHR. (Mi.); pl. 13, f. 53.
 „ *sessilis*, Ehr., Mft. (N.), RHR. (Mi.), NHd. SFy. (P.); pl. 13, f. 55.
 „ *parvula*, Kutz., Rocks, Why. (N.); pl. 13, f. 54.
 „ *coarctata*, Breb. (*Achnanthidium coarctatum*), RHR. Stl. (N.); pl. 14, f. 1.
 „ *Hungarica*, Grun. (*Stauroneis dubia*, Greg.), Ing. Sty. bp. Ditch nr. Haworth Hall (N.), Paull (P.); pl. 14, f. 2.
 „ *microcephalum*, Kutz. (*Achnanthidium microcephalum*). Wall under leaky tap (N.), Hes. Fla. (P.), Wne. Tic. Scarbro (W.); pl. 14, f. 3.
 „ *ovalis* (Greg.), V. H. (*Stauroneis ovalis*, Greg.), Skl. (N.); pl. 14, f. 4.
 „ *exilis*, Kutz., Nbd. and Cot. ss. Wne. (N.), Elm. ss. (P.), Meaux. Bvy. (W.), Hfd. (S.); pl. 14, f. 5.
 „ *minutissima*, Kutz., Hsa. mere (P.), Cot. (Mi.); pl. 14, f. 6*.
 „ *linearis*, WSm. (*Achnanthidium lineare*), Cot. Bnm. Skl. (N.), Brd. (P.); pl. 14, f. 7.

- Achnanthes trinodis* (Arnott), Grun. (*Achnanthidium trinode*),
Haworths lane (N.) ; pl. 14, f. 8.
,, *lanceolata*, Breb. (*Achnanthidium lanceolatum*),
Cot. RHI. Wne. Wtn. Bft. (N.), Wil. Brh.
(P.), Bvy. Meaux. (W.), Ask. Don. (S.) ;
pl. 14, f. 9.
,, *lanceolata*, var. *dubia* (*Achnanthidium dubium*),
Skl. (N.) ; pl. 14, f. 10.

TRIBE COCCONEIDEAE.

- Anorthoneis excentrica* (Donk.), Grun., Brd. sands (P.) ;
pl. 14, f. 11*.
Campyloneis Grevillei (WSm.), Grun. (*Cocconeis Grevillei*),
Binks Buoy (N.), RHR. (M.i) ; pl. 14, f. 12.
Pleuroneis costata (Greg.), Cl. Fla. rocks (Mi.) ; pl. 14, f. 13*.
Cocconeis scutellum, Ehr., Filey, Fla. (N.), Spn. Brd. sands
(P.), RHR. (Mi.) ; pl. 14, f. 14.
,, ,, var. *stauroneiformis*, Paull, Fla. (P.) ;
pl. 14, f. 15*.
,, ,, var. *parva*, Fla. rocks (Mi.) ; pl. 14, f. 16*.
,, *distans* (Greg.), Grun., RHR. (P.) ; pl. 18, f. 38*.
,, *pediculus*, Ehr., Cot. Bvy. RHI. (N.), Wee and
Nbd. ss. (P.) ; pl. 14, f. 17.
,, *placentula*, Ehr., Cot. Wne. Htp. (N.), HmP.
Bro. Pfn. Bog. (P.), Wre. (W.) ; pl. 14, f. 18.
,, ,, var. *lineata*, Pfn. bog. (P.), Brh. (S.) ;
pl. 14, f. 18a*.
,, *molesta*, var. *amygdalina* (*C. diaphana* WSm.),
MCh. Hsa. peat (N.), Cle. (P.) ; pl. 14, f. 19.
,, *minuta*, Cl. (*Navicula dissimilis*, WSm.), Spring
nr. Cot. (N.) ; pl. 14, f. 20.
,, *Helvetica*, Brun., Htp. Cot. (N. records as
Cocconeis n.s.), (Mi.) ; pl. 14, f. 21.

SUB-FAMILY. PSEUDO-RAPHIDEAE.

COHORT FRAGILARIINEAE.

TRIBE EPITHEMIEAE.

- Epithemia turgida* (Ehr.), Kutz., Risby, Hsa. peat (N.),
Bp. nr. East Park, Nbd. KHI. Wre. Nsm.
(W.), Hfd. (S.) ; pl. 14, f. 22.
,, *turgida*, var. *Westermanni*, Kutz., RHR. bank
(Mu.), RHR. (Mi.) ; pl. 14, f. 23.

- Epithemia turgida*, var. *granulata*, Hsa. mere and peat (N.), EvP. (P.) ; pl. 14, f. 24.
- „ *Hyndmanni*, WSm., Hsa. peat (N.), EvP. (P.) ; pl. 14, f. 25.
- „ *Sorex*, Kutz., Stepney lane (N.), Bp. nr. East Park (P.), Brh. (S.), Hsa. (W.) ; pl. 14, f. 26.
- „ *gibba*, Kutz., Risby, Dfd. Tty. (N.), KHI EvP. (P.), Hfd. (S.) ; pl. 14, f. 27.
- „ „ var. *ventricosa*, Kutz., Risby, Tty. Stl. Hsa. peat (N.), Bp. nr. East Park (P.) ; pl. 14, f. 28.
- „ *Argus*, Kutz., Hsa. peat (N.), MWn. bog. EvP. (P.), Nsm. Scarbro (W.) ; pl. 15, f. 1.
- „ „ var. *longicornis*, WSm., Hsa. peat (N.) ; pl. 15, f. 2.
- „ „ var. *amphicephala* (E. *alpestris*, WSm.), Hsa. peat (N.), KHI. MWn. bog. Nbd. ss. (P.) ; pl. 15, f. 3.
- „ *Zebra* (Ehr.), Kutz., Dfd. Wne. Hsa. mere (N.), EvP. KHI. (P.), Hsa. peat (Mi.) ; pl. 15, f. 4.
- „ „ var. *proboscidea*, Grun., Hsa. peat, Tty. (N.) ; pl. 15, f. 6.
- „ *Musculus*, Kutz., Tty. Hull & Gby. tps. Sty. (N.) ; pl. 15, f. 7.
- „ „ var. *constricta* (E. *constricta*, WSm.), Tty. Sty. (N.), RHr. (Mi.) ; pl. 15, f. 8.
- „ *gibberula*, var. *rupestris* (E. *rupestris*, WSm.), ScC. (N.) ; pl. 15, f. 9.
- „ *ocellata*, Kutz., Hsa. peat (N.) ; pl. 15, f. 10.
- Eunotia Arcus*, Ehr., Malton, Wne. (N.), KHI. (P.), Brh. (S.) ; pl. 15, f. 11.
- „ „ var. *bidens* (*Himantidium bidens*), Tol. CIM. (N.), RiC. (W.), Ask. (S.) ; pl. 15, f. 12.
- „ *major* (WSm.), Rab. (*Himantidium majus*), Cot. (N.), Seamer (W.) ; pl. 15, f. 13.
- „ *gracilis* (Ehr.), Rab. (*Himantidium gracile*), RHI. Ing. ScC. (N.), Hfd. (S.) ; pl. 15, f. 14.
- „ *exigua*, Breb., Twigmoor gull ponds, pure (P.), Ask. (S.), Malton (W.) ; pl. 15, f. 15*.
- „ *pectinalis* (Kutz.), Rab. (*Himantidium pectinale*), Cot. Sl. (N.), Nld. (P.) ; pl. 15, f. 16.
- „ „ var. *undulata*, Ralfs (*Himantidium undulatum* WSm.), Stl. (N.), Cus. (S.) ; pl. 15, f. 17.
- „ „ var. *ventricosa*, Grun., Hfd. (S.) ; pl. 26, f. 29*.

- Eunotia Veneris*, Kutz. (*E. incisa*, Greg.), RiC. SkC. (W.);
 pl. 26, f. 27*.
- „ *praerupta*, Ehr., Btn. ss. (Mi.), Pfn. bog. Nld.
 (P.), RiC. Nsm. (W.); pl. 15, f. 18*.
- „ *robusta*, Ralfs (*E. serra*, Ehr.), Brd. peat (John
 Phillips); pl. 26, f. 26*.
- „ „ var. *tetraodon* (*E. tetraodon* and *E.*
diadema), ScC. (N.), Brd. peat (John Phillips)
 Don. (S.), Str. (W.); pl. 15, f. 19.
- „ *diodon*, Ehr., Str. (W.); pl. 27, f. 5*.
- „ *monodon*, Ehr., RAb. (S.); pl. 26, f. 28*.
- „ *lunaris* (Ehr.), Grun. (*Synedra lunaris*), CIM. Tol.
 (N.), NHd. Pfn. (P.), Hfd. (S.); pl. 15, f. 20.
- „ „ var. *bilunaris*, Bvy. MWn. (W.); pl. 27, f. 6*.
- „ „ „ *undulata*, Goathland (W.); pl. 27, f. 7*.
- „ *flexuosa*, var. *bicapitata*, Grun., Hfd. (S.); pl. 27, f. 8*.

TRIBE SYNEDREAE.

- Synedra pulchella*, Kutz., RHr. (N.), Nld. bp. Ditch Holder-
 ness Rd. (P.), Wre. RiC. (W.); pl. 15,
 f. 21.
- „ „ var. *Smithii*, Ralfs. (*S. acicularis*, WSm.);
 RHr. Tty. (N.), Key. (P.); pl. 15, f. 22.
- „ „ var. *lanceolata*, O'Meara (*S. minutissima*,
 WSm.), Sty. Nld. (N.), Stn. (P.), Nsm.
 (W.); pl. 15, f. 23.
- „ *Vaucheriae*, Kutz., Wil. Hall Ings. (P.), Nsm.
 Wre. (W.); pl. 15, f. 24*.
- „ „ var. *deformis* (*S. deformis*, WSm.),
 Nbd. ss. Why. (N.); pl. 15, f. 25.
- „ *ulna* (Nitz.) Ehr., Htp. Wne. Bvy., Hsa. peat (N.),
 Nbd. Dfd. Arram, NHd. (P.); pl. 26, f. 25.
- „ „ var. *longissima* (*S. longissima*, WSm.), Ing.
 ScC. Sty. bp. Brh. (N.), Arram, Pfn. bog.
 (P.); pl. 15, f. 26.
- „ „ var. *splendens*, Bvy. Routh (W.); pl. 15, f. 27*.
- „ „ „ *obtusa*, Burton Stather (P.); pl. 15, f. 28*.
- „ „ „ *oxyrhyncus*, Londesborough Park (N.),
 Dfd. Btm. (P.); pl. 15, f. 29.
- „ „ „ *vitrea*, HmP. (P.), RiC. (W.); pl. 15, f. 30*.
- „ „ „ *aequalis* (Kutz.), RAb. RiC. (W.); pl. 26,
 f. 16*.
- „ „ „ *amphirhyncus* (Ehr.), VH. Don. (S.);
 pl. 27, f. 9*.

- Synedra Acus* (Kutz.) Grun., Endyke Lane, Key. (P.), Wre. Meaux, SkC. (W.); pl. 15, f. 31*.
- „ „ var. *delicatissima*, Brh. (N.), Key. (P.), Scarbro', MWn. (W.); pl. 15, f. 32.
- „ *radians* (Kutz.) Grun., Risby, Derwent, Cot. Wne. Nbd. (N.), Btn. ss. Pfn. bog. (P.); pl. 15, f. 33.
- „ *Gallionii*, Ehr., Fla. dredgings (N.); pl. 15, f. 34.
- „ *capitata*, Ehr., Hsa. peat, Risby (N.), KHI. Arram, Btn. ss. (P.), Hfd. (S.), Str. (W.); pl. 15, f. 35.
- „ *amphicephala*, Kutz., Btn. ss. (P.); pl. 15, f. 36*.
- „ *affinis*, Kutz., Fla. (N.), Spn. Hes. Creek (P.); pl. 15, f. 37.
- „ „ var. *gracilis* (*S. gracilis* Kutz.), RHR. (N.); pl. 15, f. 38.
- „ „ „ *tabulata* (*S. tabulata*, Kutz.), RHR. Mft. (N.), Paull (P.); pl. 15, f. 39.
- „ „ „ *hamata* (*S. hamata*, WSm.), outlet Ripley Lake (N.); pl. 15, f. 40.
- „ „ „ *fasciculata* (*S. fasciculata*, Kutz.), Ripley (N.), Spn. Paull (P.); pl. 15, f. 41.
- „ *fulgens* (Kutz.), WSm., Mft. Cle. (N.); pl. 15, f. 42.
- „ *superba*, Kutz., Gby. Cle. Why. (N.); pl. 15, f. 43.
- „ *baculus*, Greg., RHR. (Mi.); pl. 15, f. 44*.
- Asterionella formosa*, Hass., outlet Ripley Lake (N.), Ask. (S.), Str. (W.); pl. 15, f. 45.
- „ „ var. *Bleakleyi*, WSm., Asc. (N.); pl. 15, f. 46.
- „ „ „ *Ralfsii*, WSm., Asc. (N.); pl. 15, f. 47.
- „ „ „ *gracillima*, ditch Sty. (Norman's slide) (P.); pl. 26, f. 8*.

TRIBE FRAGILARIEAE.

- Fragilaria virescens*, Ralfs., Ing. Cot. Wne. (N.), Endyke Lane (P.); pl. 20, f. 1.
- „ *undata*, WSm., Elm. ss. (P.); pl. 20, f. 2*.
- „ *striatula*, Lyngb., Fla. Filey (N.); pl. 20, f. 5.
- „ *hyalina* (Kutz.), Grun. (*Diatoma hyalina*, Kutz.), Filey (N.); pl. 20, f. 6.
- „ *capucina*, Desm., Ing. Cot. (N.), HmP. Hsa. mere, Wee. ss. Wil. (P.), RAb. (C.); pl. 20, f. 7.

- Fragilaria capucina*, var. *mesolepta*, Elm., ss. Cot. (P.);
pl. 20, f. 8*.
- „ *construens* (Ehr.), Grun. (*Odontidium tabellaria*,
WSm.), Risby, Hsa. mere, Wne.
(N.), Bvy. (W.), Cus. Don. (S.);
pl. 20, f. 9.
- „ „ var. *venter* (*Odontidium parasiticum*
WSm.), MWn. c. ScC. Bvy.
(N.), RHL. Pfn. bend (P.);
pl. 26, f. 9.
- „ „ „ *binodis*, RAB. (S.); pl. 20, f. 10.
- „ *tenuicollis*, var. *intermedia*, Pfn. bog. (P.);
pl. 20, f. 11*.
- „ *Harrisonii* (WSm.) Grun. (*Odontidium Harrisonii*,
WSm.), Htp. Cot. Hsa. peat (N.), Pfn. (P.),
Cus. (S.), RAB. (C.); pl. 20, f. 12.
- „ *mutabilis* (WSm.) Grun., Risby, Wne. Cot.
MWn. c. (N.), RFy. Wee and Elm. ss. (P.),
Bvy. (W.), Cus. (S.); pl. 20, f. 13.
- Campylosira cymbelliformis* (A. S.) Grun. (*Dimeregramma*
arcus, Stain), Asc., Mft. Sty. VD. piers (N.); pl. 20,
f. 14.

TRIBE RAPHONEIDEAE.

- Raphoneis amphiceros*, Ehr. (*Doryphora amphiceros*, Ehr.),
RHL. Sty. (N.), Spn. Paull, Brw. Cle. (P.),
RHR. (Mi.); pl. 21, f. 15.
- „ *Belgica*, Grun., RHL. (Mi.); pl. 20, f. 16*.
- Plagiogramma Gregorianum*, Grev., Asc., ditch nr. RHR.
(N.); pl. 20, f. 17.

COHORT TABELLARIINEAE.

TRIBE LICMOPHOREAE.

- Licmophora Dalmatica* (Kutz.), Grun.. var. *tenella* (*Rhipi-*
dophora tenella, Kutz.), Filey (N.); pl. 20,
f. 18.
- „ *Anglica* (Kutz.), Grun. (R. *Anglica*, Kutz.),
Why. (N.), Wsa. (P.); pl. 20, f. 19.
- „ *paradoxa* (Lyng.), Ag. (R. *peradoxa*), Fla. (N.);
pl. 20, f. 20.
- „ *communis* (Heib.), Grun., Fla. (P.); pl. 20,
f. 21*.

TRIBE MERIDIONEAE.

- Meridion circulare*, Ag., Htp. Cot. MWn. c. Dfd. (N.),
Run. HmP. Atk. (P.), Hfd. (S.);
pl. 20, f. 22.
- „ „ var. *constrictum*, Spring ditch (Mu.),
Stl. Bft. (N.); pl. 20, f. 23.
- „ „ „ *Zinkenii*, Kutz., NHd. Atk. (P.);
pl. 20, f. 24*.

TRIBE DIATOMEAE.

- Diatoma vulgare*, Bory., Wne. Malton, Knaresbro', (N.),
Dfd. (P.), Wre. (W.), Ask. Cus. (S.); pl. 20,
f. 25 and 29.
- „ *elongatum*, Ag., Skl. MWn. c. RHr. (N.), KHL.
Pfn. bog. (P.), Wre. (W.), Hfd.
Cus. (S.); pl. 20, f. 26.
- „ „ var. *Ehrenbergii* (D. grande, WSm.),
wall under leaky tap (N.); pl. 20,
f. 27.
- „ *hiemale* (Lyng.) Heib., Nbd. & Wee. ss. (P.), Brh.
(S.), Scarbro (W.); pl. 20, f. 28;
pl. 26, f. 33*.
- „ „ var. *mesodon*, Nbd. & Wee. ss. (P.),
RAb. (C.); pl. 26, f. 34*.
- Denticula tenuis*, Kutz., RHL. Wne. Nbd. (N.), Anlaby Rd.
(Mu.), Hsa. mere (Mi.), KHL. (P.);
pl. 20, f. 30.
- „ „ var. *inflata* (D. inflata, WSm.), Nbd. ss.
(N.), Btn. & Wtn. ss. (P.); pl. 20,
f. 31.
- „ „ „ *frigida*, Hsa. mere, Elm. ss. (P.);
pl. 20, f. 32*.

TRIBE TABELLARIEAE.

- Grammatophora marina* (Lyng.), Kutz., Fla. Filey, Why.
(N.), VD. tp. (Mu.), Spn. (P.);
pl. 20, f. 33.
- „ „ var. *macilenta* (G. macilenta (WSm.),
Why. Filey (N.); pl. 20, f. 34.
- „ *serpentina* (Ralfs.), Ehr., Why. Fla. (N.);
pl. 20, f. 35.
- „ *oceanica*, Ehr., RHr. (Mi.); pl. 26, f. 10*.

- Tabellaria fenestrata* (Lyng.), Kutz., SkC. (W.); **pl. 20, f. 37*.**
 „ *flocculosa* (Roth.), Kutz., Cot. Stl. Risby (N.),
 KHL. (P.), Brh. (S.), RiC. (W.); **pl. 20, f. 38.**
Tetracyclus rupestris (Braun.), Grun., Goole (J. Harrison);
 „ **pl. 26, f. 30*.**
Rhabdonema Adriaticum, Kutz., Why. (N.); **pl. 20, f. 39.**
 „ *arcuatum* (Ag.), Kutz., Filey, Why. Fla. (N.),
 Dcs. (H.), Spn. (P.), RHR. (Mi.); **pl. 20, f. 40.**
 „ *minutum*, Kutz., Filey, Why. (N.), Spn. (P.),
 RHR. (Mi.); **pl. 20, f. 41.**

TRIBE SURIRELLINEÆ.

- Cymatopleura elliptica* (Breb.), WSm., common in fresh
 water; **pl. 21, f. 1.**
 „ „ *var. Hibernica*, Nld. bp. RFy. (P.),
 Hfd. (S.); **pl. 21, f. 2*.**
 „ „ *var. constricta*, Grun., Goole (W.);
 „ **pl. 21, f. ***
 „ *Solea* (Breb.), WSm., common in fresh water;
 „ **pl. 21, f. 3.**
 „ „ *var. apiculata* (*C. apiculata*, WSm.),
 Cot. Skl. Net. (N.), HWW. (Mi.),
 RFy. (P.), RAb. (C.); **pl. 21, f. 4.**
Surirella biseriata, Breb., Cot. Wne. MWn. (N.), Dun. Htp.
 Arram, Wee. ss. (P.), Cus. (S.); **pl. 21, f. 5.**
 „ *linearis*, WSm., Cot. Bvy. Wne. MWn. (N.), Nbd.
 & Btn. ss. (P.), RAb. (C.); **pl. 21, f. 6.**
 „ *constricta* (*S. Smithii* Ralfs), Run. (Mi.), Meaux (P.);
 „ **pl. 21, f. 7*.**
 „ *elegans*, Ehr., ScC. Hsa. peat, MWn. c. (N.),
 Run. (P.); **pl. 21, f. 8.**
 „ *subsalsa*, WSm., RHR. (N.); **pl. 21, f. 9.**
 „ *robusta*, Ehr. (*S. nobilis*, WSm.), Cot. MWn. Sty.
 (N.), Nbd. Twigmoor (P.); **pl. 21, f. 10.**
 „ „ *var. splendida* (*S. splendida*, Kutz), MWn.
 c. Sty. (N.), Bvy. (W.), MWn. bog.
 (Mi.), Wee. Nbd. & Btn. ss. (P.);
 „ **pl. 21, f. 11.**
 „ „ *var. tenera* Greg., Spd. Stn. dr. Bro. (P.);
 „ **pl. 21, f. 12*.**
 „ *striatula*, Turpin, Stl. MWn. c. RHR. RHL. (N.),
 Hes. creek, Key. dr. (P.); **pl. 21, f. 13.**
 „ „ *forma biplicata*, Sty., found in Norman's
 slide; **pl. 26, f. 11*.**

- Surirella gemma*, Ehr., RHL. Hes. (N.), NHd. Cle. (P.), RHR. (Mi.); pl. 21, f. 14.
- „ *fastuosa*, Ehr., Asc. (N.), RHR. (Mi.); pl. 21, f. 15.
- „ *turgida*, WSm., RHL. (N.), RHR. (Mu.); pl. 21, f. 16.
- „ *ovalis*, Breb., Stl. Sty. Hsa. peat (N.), RHR. (M?), Hes. (P.), Hfd. (S.); pl. 21, f. 17.
- „ „ var. *Crumena*, Breb., Slt. Htp. Har. (N.), RFy. Cle. Bro. (P.); pl. 21, f. 18.
- „ „ „ *Brightwellii* (WSm.), Hsa. peat, Sty. MWn. c. RHL. (N.), Gby. (P.); pl. 21, f. 19.
- „ „ „ *ovata*, Kutz., RHL. Skl. Cot. (N.), on walls West Dock subway (deformed valves) (P.); pl. 21, f. 20.
- „ „ „ *minuta*, Breb., Htp. RHL. (N.), VD. tp. (Mu), Thornton-le-Moor (H), Spd. Stn. dr. Wil. Fla. (P.), Wne. (W.); pl. 21, f. 21.
- „ „ „ *salina*, WSm., RHL. (N.), Gby. RHR. Key. dr. (P.), Wne. (W.); pl. 21, f. 22.
- „ „ „ *angusta*, Kutz., Sty. (Mu.), Stl. Cot. (N.), Fla. Wil. Btm. (P.), Cus. (S.); pl. 21, f. 23.
- „ „ „ *apiculata*, RHR. (Mi.); pl. 21, f. 24*.
- „ „ „ *panduriformis*, WSm., Skl. Net. MWn. c. (N.), Btm. (P.), Tic. (W.); pl. 21, f. 25.
- „ „ „ *pinnata*, WSm., Risby, Cot. Htp. Hsa. peat (N.), Arram, Wil. (P.); pl. 21, f. 26.
- „ *fluminensis*, Grun., RHR. (Mi.); pl. 21, f. 27*.
- „ *spiralis*, Kutz. (*Campylodiscus spiralis*, WSm.), Htp. Skl. (N.), Nbd. & Btn. ss. (P.), Ask. (S.); pl. 21, f. 28.
- Campylodiscus Hodgsonii*, WSm., Fla. dredgings (N.), Cle. (P.); pl. 21, f. 29.
- „ *decorus*, Breb., Asc. (N.); pl. 21, f. 30.
- „ *parvulus*, WSm., Asc. (N.), RHR. (Mi.), Hes. creek, Cle. (P.); pl. 21, f. 31.
- „ *Echineis*, Ehr., Key. dr. (P.); pl. 21, f. 32*.
- „ „ var. *cribrosus*, WSm., † Mft. MWn. c. (N.), RHR. Hes. (Mi.), Brh. (S.); pl. 27, f. 12.

† Owing to the varieties of *C. Echineis* Ehr., we have divided this species into the type form and such forms as are more like *C. cribrosus* WSm. We may add that the latter are more common in England.

- Campylodiscus clypeus*, Ehr., RHL. nr. Haworth Hall (P.);
 pl. 22, f. 1*.
- „ *Thuretii*, Breb., RHR. (Mi.); pl. 22, f. 2*.
- „ *Hibernicus*, Ehr. (*C. costatus*, WSm.), Htp.
 Nbd. MWn. c. (N.), Cave, Wee. ss. Gan.
 (P.), Cus. (S.), Brd. peat, recorded as *C.*
zonalis (John Phillips); pl. 22, f. 3.

COHORT NITZSCHIINEAE.

TRIBE NITZSCHIEAE.

- Hantzschia amphioxys* (Ehr.), Grun. (*Nitzschia amphioxys*
 WSm.), Bnm. Net. Cot. Wne. MWn. (N.),
 Gan. Wil. (P.), RAb. (C.), Meaux (W.);
 pl. 23, f. 1.
- „ *virgata* (Roper) Grun. (*Nitzschia virgata*, Roper),
 Hsa. sands, Fla. (N.); pl. 23, f. 2.
- „ *marina* (Donk.), Grun. (*Epithemia marina*, Donk.),
 Hsa. sands (N.), RHR. (P.); pl. 23, f. 3.
- Nitzschia navicularis* (Breb.), Grun. (*Tryblionella marginata*,
 WSm.), Stl. Sty. Outlet Hsa. mere (N.),
 Arram, WD. Key. dr. (P.); pl. 23, f. 4.
- „ *punctata* (WSm.) Grun. (*T. punctata*, WSm.),
 MWn. c. Gby. Hollym carrs (N), Clé. Mft.
 WD. (P.), RHR. (Mi.), Brh. (S.); pl. 23, f. 5.
- „ „ *var. elongata* (*Tryblionella gracilis*, WSm.),
 RHR. Hsa. peat, MWn. c. (N.); pl. 26, f. 12.
- „ *Tryblionella* Hantzsch (*T. Scutellum*, WSm.), RFy.
 (N.), RHR. (H.), Paull, Hes. creek,
 Sty. (P.), RHR. (Mi.); pl. 23, f. 6.
- „ „ *var. maxima*, Grun., RHR. (Mi.);
 pl. 23, f. 7*.
- „ „ „ *Levidensis*, WSm. (*T. Levidensis*)
 Hsa. peat (N.); pl. 23, f. 8.
- „ *debilis* (Arnott), Grun., water tank, Hull (N.),
 HWW. (Mi.), WD. subway (P.); pl. 23, f. 9.
- „ *angustata* (WSm.), Grun. (*T. angustata*, WSm.),
 MWn. c. Bvy. (N.), Anlaby Road (Mu.), Nld.
 bp. Run. Mft. (P.), RAb. (C.), Nsm. (W.);
 pl. 23, f. 10.
- „ *constricta* (Greg.), Grun. (*T. constricta*, WSm.),
 Asc. (N.), Cle. (P.); pl. 23, f. 11.
- „ *plana*, WSm., RHR. Ditch nr. RHL. (N.), Paull (P.);
 pl. 23, f. 12.

- Nitzschia Hungarica*, Grun., Stn. dr. (P.), Brh. (S.); pl. 23, f. 13*.
- „ *apiculata* (Greg.), Grun. (*T. apiculata*, Greg.), ScC. Patrington (N.), Gan. Sty. (P.); pl. 23, f. 14.
- „ *acuminata* (WSm.), Grun. (*T. acuminata*, WSm.), Stl. Cot. (N.), VD. tp. (H.); pl. 23, f. 15.
- „ *circumsuta* (Bailey), Grun., Cle. (P.), Goole (J. Harrison), Ask (S.); pl. 23, f. 16*.
- „ *dubia*, WSm., Stl. Cot. Tty. Wne. Htp. (N.), Sty. Wil. Nld. bp. (P.); pl. 23, f. 17.
- „ *commutata*, Grun., SFy. (P.); pl. 23, f. 18*.
- „ *bilobata*, WSm., Stl. Hsa. mere outlet, Brh. (N.), NHd. Cle. (P.), VD. RHr. (Mi.); pl. 23, f. 19.
- „ *Denticula*, Grun. (*Denticula obtusa*, WSm.), Hsa. mere, Brh. (N), Scarbro (W.); pl. 27, f. 10.
- „ *sinuata* (WSm.), Grun. (*D. sinuata*, WSm), Cot. Woodmancy (N.), MWn. bog. Pool in Hes. chalk pits (P.), RAb. (C.); pl. 23, f. 20.
- „ *scalaris*, WSm., Mtn. peat, Skl. (N.); pl. 23, f. 21.
- „ *insignis*, Greg., Fla. dredgings (N.); pl. 23, f. 22.
- „ *paradoxa* (Gmel.), Grun. (*Bacillaria paradoxa*, Gmel.), Sty. VD. tp. MWn. c. (N.), Cle. SFy. (P.), Goole (W.); pl. 23, f. 23.
- „ *vivax*, WSm., Ditch, Sty. (N.), Cle. (P.); pl. 23, f. 24.
- „ *angularis*, WSm., VD. tp. Why. (N.), RHr. (Mi.), NHd. Cle. (P.); pl. 23, f. 25.
- „ *spathulata*, Breb., Hes. (H.), Hsa. sands (N.), RHr. (Mu.); pl. 23, f. 26.
- „ *cursoria* (Donk), Grun. (*Bacillaria cursoria*, Donk), Hsa. sands (N.); pl. 23, f. 27.
- „ *dissipata* (Kutz), Grun. (*N. minutissima*, WSm.), Poultry trough (N.), Dfd. (P.); pl. 23, f. 28.
- „ „ *var. media*, V.H., MWn. (W.); pl. 27, f. 11*.
- „ *sigmoidea* (Ehr), WSm., common in fresh water; pl. 23, f. 29.
- „ *vermicularis* (Kutz), Grun. (*N. sigmoidea*, var. β , WSm.), ScC. Mtn. peat (N.), HWW. (Mi.), Htp. (P.); pl. 23, f. 30.
- „ *Brebissonii*, WSm., RHr. Sty. bp. (N.), Wil. (P.); pl. 23, f. 31.
- „ *Sigma*, WSm., Dcs. RHl. Gby. VD. tp. (N.), Cle. Hes. creek (P.), RHr. (Mi.); pl. 23, f. 31a.
- „ „ *var. intercedens*, Grun., RHr. (Mi.); pl. 23, f. 32*.

- Nitzschia Sigma*, var. *rigida* (Kutz), Grun. (*Amphipleura sigmoidea*, WSm.), Asc. RHr. (N.); pl. 23, f. 33.
- „ „ „ *rigidula*, Grun., RHr. (Mi.), Hull pier (P.); pl. 23, f. 34*.
- „ „ „ *Sigmatella*, Grun. (*N. curvula*, WSm.), Sty. Stn. (H.), Bvy. (N.), RHi. (P.), RHr. (Mi.); pl. 33, f. 35.
- „ *fasciculata*, Grun. (*Homaeocladia sigmoidea*, WSm.), VD. piers, NHd. Hes. (N.), SFy. RHi. (P.); pl. 23, f. 36.
- „ *obtusa*, var. *scalpelliformis*, Grun., Arram carrs (Mi.), Wre. (W.); pl. 24, f. 1*.
- „ „ „ *brevissima* (*N. parvula*, WSm.), MWn. Wsa. Cot. (N.); pl. 26, f. 14.
- „ *spectabilis* (Ehr.), Ralfs., Sty. (N.), Wil. (P.); pl. 24, f. 2.
- „ *linearis* (Ag.), WSm., Htp. Cot. Bvy. (N.), RFy. Wee. Wil. Gan. (P.); pl. 24, f. 3.
- „ „ var. *tenuis* (*N. tenuis*, WSm.), Htp. Bvy. Cot. (N.), Wre. Tic. (W.); pl. 24, f. 4.
- „ *vitrea*, Norm., Sty. bp. Brh. (N.), WD. subway, NHd. (P.); pl. 24, f. 5.
- „ *lanceolata*, WSm., Asc. (N.), Mft. (P.); pl. 24, f. 6.
- „ „ *forma minor*, Hull docks, Sculcoates lane (P.); pl. 24, f. 7*.
- „ *Palea*, (Kutz.) WSm., Cot. Sty. (N.), WD. subway, Gan. Wtn. ss. (P.); pl. 24, f. 8.
- „ „ var. *tenuirostris*, Grun., Spd. (P.); pl. 24, f. 9*.
- „ *communis*, Rab., RHr. (Mi.); pl. 24, f. 10*.
- „ *amphibia*, Grun. (*Denticula decipiens* Rylands), Sty. (N.), HmP. (P.); pl. 24, f. 11.
- „ *longissima* (Breb.), Ralfs. var. *Closterium* (*N. Closterium*, WSm.), RHr. Mft. Gby. (N.), VD. (Mi), Paull (P.); pl. 24, f. 13.
- „ „ (Breb.), Ralfs., var. *reversa* (*N. reversa*, WSm.), Sty. (N.); pl. 24, f. 14.
- „ „ (Breb.), Ralfs., var. *parva*, RHr. (P.), HWW. (Mi.); pl. 24, f. 15.
- „ *acicularis*, WSm., Cot. Dcs. (N.), Gan. Hes. creek (P.), Stn. Wre. (W.), Hfd. (S.); pl. 24, f. 16.
- „ *filiformis*, WSm. (*Homaeocladia filiformis*, WSm.), Stn. Sty. (N.); pl. 24, f. 17.
- „ *subcohaerens*, Grun., Magnesian well Har. (N.); pl. 26, f. 13.

Cylindrotheca gracilis (Breb.), Grun. (*Nitzschia Taenia*, WSm.), RHR. Mft. (N.), Gan. Kelwell nr. Swine (P.), Wne. (W.); pl. 24, f. 18.

SUB-FAMILY CRYPTORAPHIDIEAE.

TRIBE CHAETOCERAE.

- Rhizosolenia robusta*, Norm., Asc. (N.) ; pl. 18, f. 40.
 „ *setigera* Bright, Asc. (N.) ; pl. 24, f. 36.
 „ *calcar-avis*, Schul, Asc. (N.) ; pl. 18, f. 39.
 „ *styliformis*, Bright, Asc. (N.), North Sea (Cl.) ; pl. 20, f. 43.
 „ *imbricata*, Bright, Asc. (N.) ; pl. 20, f. 44.
 „ *alata*, Bright, Asc. (N.)) pl. 24, f. 37.
Chaetoceros armatus, West, Hsa. sands (N.) ; pl. 24, f. 19.
 „ *Wighamii*, Bright, Asc. (N.) ; pl. 28, f. a.
 „ *Lorenzianus*, Grun. (*C. bacillaria*, Bail.), Asc. (N.) ; pl. 24, f. 21.
 „ *Lorenzianus*, Endocysts of, recorded by Norman in Ascidian gathering. (Syn. *Dicladia capreolus*, Ehr.) ; pl. 24, f. 26.
 „ *borealis*, Bright, Asc. (N.), North Sea (Cl.) ; pl. 24, f. 22.
 „ *Peruvianus*, Bright, Asc. (N.) ; pl. 24, f. 23.
 „ *Danicus*, Cl., North Sea (Cl.) ; pl. 24, f. 20*.
 „ *diadema* (Ehr.), Cl., Spores of, recorded by Norman in Ascidian gathering. (Syn. *Syndendrium diadema*, Ehr.) ; pl. 24, f. 27.
 „ *didymus* (Ehr.), Cl., North Sea (Cl.) ; pl. 28, f. b*.
 „ *teres*, Cl., North Sea (Cl.) ; pl. 28, f. c*.
 „ *decipiens*, Cl., North Sea (Cl.) ; pl. 28, f. d*.
 „ *currens*, Cl., North Sea (Cl.) ; pl. 28, f. e*.
Bacteriastrium varians Lauder (*B. furcatum*, Ehr.), Asc. (N.) ; pl. 24, f. 24.
Ditylum Brightwellii (West), Grun., Asc. (N.) ; pl. 24, f. 25.

TRIBE MELOSIREAE.

- Stephanopyxis Turris* (Grev.). Ralfs. (*Creswellia turris*, Arnott), Asc. (N.) ; pl. 25, f. 22.
Skeletonema costatum (Grev.), Cl. (*Melosira costata*, Grev.), Asc. (N.) ; pl. 25, f. 23.
Melosira nummuloides (Bory), Ag., Hull and Gby. tp. Sty. RHR. (N.), NHd. Paull (P.) ; pl. 25, f. 24.

- Melosira Westii*, WSm. (*Orthosira Westii*, WSm.), North Sea (N.), RHr. (Mi.) ; pl. 25, f. 24a.
- „ *Borreri*, Grev., VD. tp. (N.), RHr. (Mi.), NHd. (P.) ; pl. 25, f. 25.
- „ *varians*, Ag. Common in fresh water ; pl. 25, f. 26.
- „ *Jurgensii*, Ag. (*M. subflexilis*, WSm.), Sty. RHr. (N.) ; pl. 25, f. 27.
- „ *Roeseana*, Rab. (*Orthosira spinosa*, WSm.), Hsa. peat, Roof moss, Stl. (N.) ; pl. 25, f. 28.
- „ *distans*, var. *nivalis* (*Coscinodiscus minor*, Kutz.), RHr. (N.) ; pl. 25, f. 29.
- „ *crenulata*, Kutz. (*O. orichalcea*, WSm.), Thorne Moor (N.) ; pl. 25, f. 30.
- „ *arenaria*, Moore (*O. arenaria*, WSm.), Nbd. ss. Hsa. peat (N.), Wee. ss. Pfn. (P.) ; pl. 25, f. 31.
- „ *granulata* (Ehr.), Ralfs. (*O. punctata*, WSm.), Hsa. peat, Sty. (N.) ; pl. 25, f. 32.
- „ *sulcata* (Ehr.), Kutz. (*O. marina*, WSm.), Hsa. sands, Asc. (N.), Fla. rocks, Cle. (P.), Fla. dredgings, RHr. (Mi.) ; pl. 25, f. 33.
- Cyclotella striata* (Kutz.), Grun. (*C. Dallasiana*, WSm.), Sty. (N.), Paull (P.) ; pl. 24, f. 28.
- „ *antiqua*, WSm., Hsa. peat (N.) ; pl. 24, f. 29.
- „ *comta*, var. *radiosa*, Khl. Wtn. ss. (P.) ; pl. 24, f. 30*.
- „ *operculata*, Kutz., Cot. Spring ditch, Ripley (N.), Hes. Btn. and Elm. ss. (P.) ; pl. 24, f. 31.
- „ *Meneghiniana*, Kutz., Sty. Leven dr. (N.), Btn. ss. Pfn. bog. (P.) ; pl. 24, f. 32.
- „ *Kutzingiana* Chauvin, Cot. Sty. Tty. MWn. c. Wne. Ing. (N.), Btn. Hes. (P.) ; pl. 24, f. 33.
- Podosira Smithiana*. Grun., RHr. (Mi.) ; pl. 26, f. 6*.
- Hyalodiscus stelliger*, Bail. (*Podosira maculata*, WSm.), Fla. dredgings, Asc. (N.), Fla. RHr. (Mi.) ; pl. 24, f. 34.
- „ *Scoticus* (Kutz.), Grun. (*Podosira hormoides* (Kutz., WSm.), Asc. (N.) ; pl. 24, f. 35.

TRIBE BIDDULPHIÆ.

- Eucampia Zodiacus*, Ehr., Asc. (N.) ; pl. 22, f. 16.
- Biddulphia aurita* (Lyng.) Breb., Asc. Humber buoys (N.), Spn. (P.), RHr. (Mi.) ; pl. 22, f. 4.
- „ *Rhombus* (Ehr.), WSm., Asc. Fla. dredgings (N.), Fla. (Mi.) ; pl. 22, f. 5.
- „ „ var. *trigona*, Cl. (*Triceratium striolatum*, Ehr.), Asc. (N.) ; pl. 22, f. 6.

- Biddulphia Baileyi*, WSm. (*B. mobiliensis*, Bail.), Asc. (N.), North Sea (Cl.) ; pl. 22, f. 7.
 „ *granulata*, Roper, Asc. Hsa. sands (N.), Brd. sands (P.) ; pl. 22, f. 8.
 „ *turgida*, WSm., Asc. (N.), Spn. (P.) ; pl. 22, f. 9.
Cerataulus Smithii, Ralfs (*Biddulphia radiata*, Roper), Asc. (N.), RHr. (Mi.) ; pl. 22, f. 10.
Amphitetras antediluviana, Ehr., WD. excavation (N.), East Hull bp. (P.) ; pl. 22, f. 11.
Triceratium favus, Ehr., VD. Asc. (N.), RHr. (Mi.) ; pl. 22, f. 12.
 „ *alternans*, Bail., Asc. (N.), RHr. (Mi.) ; pl. 22, f. 13.
 „ *armatum*, Roper, Asc. (N.) ; pl. 22, f. 14.
 „ *variabile*, Bright, Asc. (N.) ; pl. 22, f. 15.

TRIBE EUPODISCEAE.

- Auliscus sculptus* (WSm.), Ralfs. (*Eupodiscus sculptus*, WSm.), Asc. (N.), Fla. (Mi.) ; pl. 25, f. 1.
Eupodiscus Argus, Ehr., Fla. dredgings, Asc. (N.), Brd. sands (P.), Fla. (Mi.) ; pl. 25, f. 2.
Aulacodiscus Sollittianus, Arnott, RHI. nr. Haworth Hall (P.) ; pl. 25, f. 3*.
Roperia tessellata (Roper), Grun. (*Eupodiscus tessellatus*, Roper), Asc. (N.) ; pl. 25, f. 4.

TRIBE HELIOPELTEAE.

- Actinoptychus undulatus*, Ehr. (*Actinocyclus undulatus*, Kutz.), Asc. Fla. Sty. (N.), RHr. (Mi.), RHI. Spn. Brd. sands Cle. (P.) ; pl. 25, f. 5.
 „ *splendens* (Shad.), Ralfs. (*Actinocyclus sedenarius* Roper), Asc. (N.), Fla. (Mi.) ; pl. 25, f. 6.

TRIBE COSCINODISCEAE.

- Actinocyclus Ralfsii*, WSm. (*Eupodiscus Ralfsii*, WSm.), Asc. (N.) ; pl. 25, f. 7.
 „ *crassus*, (WSm.), Ralfs. (*E. crassus*, WSm.), Hsa. sands, Sty. (N.), Fla. (Mi.) ; pl. 25, f. 8.
 „ *Roperii* (Breb.), Kitt. (*Coscinodiscus ovalis*, Roper), Asc. (N.) ; pl. 25, f. 9.
 „ *Ehrenbergii*, Ralfs., Fla. (Mi.) ; pl. 26, f. 2*.
Coscinodiscus perforatus, Ehr., Asc. (N.) ; pl. 25, f. 10.
 „ *radiatus*, Ehr., Fla. MWn. c. (N.), Brd. sands, RHI. (P.), RHr. (Mi.) ; pl. 25, f. 11.

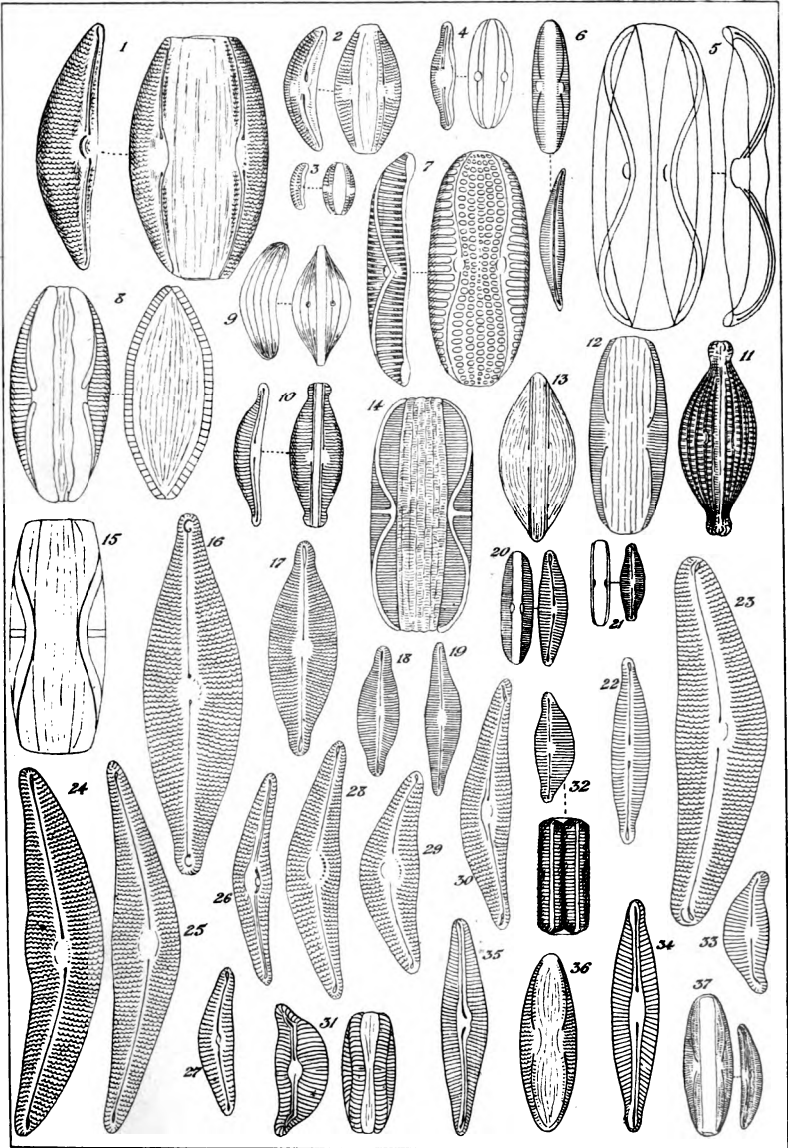
- Coscinodiscus oculus iridis*, Ehr., Dcs. clay boring Fla. (Mi.), North Sea (Cl.); pl. 26, f. 1*.
- „ *centralis*, Ehr., Asc. (N.), RHr. Fla. (Mi.); pl. 25, f. 12.
- „ *concinus*, WSm., Asc. (N.), RHr. (Mi.), North Sea (Cl.); pl. 25, f. 13.
- „ *excentricus*, Ehr., Asc. (N.), Brd. sands, Spn. (P.), RHr. (Mi.); pl. 25, f. 14.
- „ *decipiens*, Grun. (C. minor, Ehr.), Asc. (N.), RHl. (P.); pl. 25, f. 15.
- „ *subtilis* (Ehr.), Grun., Brackish puddle, Humber bank (N.); pl. 25, f. 16.
- „ „ var. *Normanii*, Greg. (C. fasciculatus, A.S.), Asc. (N.), Fla. (Mi.); pl. 25, f. 17.
- „ *lacustris*, Grun. (*Cyclotella punctata*, WSm.), MWn. c. RFy. (N.); pl. 25, f. 18.
- „ *labyrinthus*, Roper, Asc. (N.); pl. 25, f. 19.
- „ *obscurus*, A.S., RHr. (Mi.); pl. 25, f. 20*.
- „ *symmetricus*, Grev., RHr. (Mi.); pl. 25, f. 22*.

DESCRIPTION OF PLATES.

PLATE 12.

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| <ol style="list-style-type: none"> 1. <i>Amphora ovalis</i> Kutz. 2. " " var <i>affinis</i>. 3. " " " <i>pedi-</i>
 <i>culus</i>. 4. <i>Amphora Normanii</i> Rab. 5. " <i>arenaria</i> Donk. 6. " <i>angusta</i> Greg. 7. " <i>crassa</i> Greg. 8. " <i>commutata</i> Grun. 9. " <i>coffeaeformis</i> Kutz. 10. " <i>salina</i> WSm. 11. " <i>costata</i> WSm. 12. " <i>lineolata</i> Ehr. 13. " <i>hyalina</i> Kutz. 14. " <i>ostrearia</i> Breb. 15. " " var <i>quad-</i>
 <i>rata</i>. 16. <i>Cymbella Ehrenbergii</i> Kutz. 17. " <i>cuspidata</i> Kutz. 18. " <i>amphicephala</i> Naeg 19. " <i>obtusa</i> Greg. 20. " <i>affinis</i> Kutz. 21. " <i>microcephala</i> Grun. | <ol style="list-style-type: none"> 22. <i>Cymbella aequalis</i> WSm. 23. " <i>gastroides</i> Kutz. 24. " <i>lanceolata</i> Ehr. 25. " " var <i>cor-</i>
 <i>nuta</i>. 26. <i>Cymbella cymbiformis</i> Ehr. 27. " " var <i>parva</i>
 WSm. 28. <i>Cymbella Cistula</i> Hempr. 29. " " var <i>mac-</i>
 <i>ulata</i> Kutz. 30. <i>Cymbella Helvetica</i> Kutz. 31. <i>Encyonema prostratum</i>
 Ralfs. 32. <i>Encyonema caespitosum</i>
 Kutz. 33. <i>Encyonema ventricosum</i>
 Kutz. 34. <i>Encyonema gracile</i> Rab. 35. " " var
 <i>Scotica</i> WSm. 36. <i>Amphora ovalis</i> var <i>gracilis</i>. 37. " <i>Proteus</i>, Greg. |
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PLATE 12



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PLATE 13.

1. *Mastogloia Smithii* Thw.
2. " " *varlacustris*
3. " *lanceolata* Thw.
4. " *apiculata* WSm.
5. " *Dansei* Thw.
6. " *Grevillei* WSm.
7. *Stauroneis Phenicenteron*
Ehr.
8. *Stauroneis gracilis* Ehr.
9. " *acuta* WSm.
10. " *spicula* Hickie.
11. " *salina* WSm.
12. " *anceps* Ehr.
13. " " *varlinearis*. Kutz
14. " *anceps* var *amphi-*
 cephala.
15. *Stauroneis Smithii* Grun.
16. " *Legumen* Ehr.
17. *Amphora veneta* Kutz.
18. " *fusca* A.S.
19. *Cymbella cuspidata* var
 naviculiformis.
20. *Encyonema turgidum*
 (Greg) Grun.
21. *Encyonema caespitosum*
 var *Auerswaldii*.
22. *Stauroneis Gregorii* Ralfs.
- 23† *Mastogloia exigua* Lewis.
24. *Navicula follis* Ehr.
25. *Amphiprora alata* Kutz.
26. " *paludosa* WSm.
27. " *ornata* Bail.
28. *Orthotropis lepidoptera*
 (Greg) Cl.
29. *Orthotropis lepidoptera* var
 Mediterranea.
30. *Plagiotropis elegans*
 (WSm.) Grun.
31. *Plagiotropis vitrea* (WSm.)
 Grun.
32. *Gomphonema constrictum*
 Ehr.
33. *Gomphonema constrictum*
 var *capitatum*.
34. *Gomphonema acuminatum*
 Ehr.
35. *Gomphonema acuminatum*
 var *elongatum*.
36. *Gomphonema acuminatum*
 var *trigonocephalum*.
37. *Gomphonema Augur* Ehr.
38. " *subtile* Ehr.
39. " *montanum* var
 commutatum.
40. *Gomphonema parvulum*
 Kutz.
- 41 & 41a. *Gomphonema gracile*
 Ehr.
42. *Gomphonema micropus*
 Kutz.
43. *Gomphonema intricatum*
 Kutz.
44. *Gomphonema intricatum*
 var *vibrio* Ehr.
45. *Gomphonema angustatum*
 Kutz.
46. *Gomphonema olivaceum*
 Kutz.
47. *Gomphonema exiguum*
 Kutz.
48. *Gomphonema insigne* Greg.
49. *Rhoicosphenia curvata*
 (Kutz) Grun.
50. *Rhoicosphenia curvata* var
 marina.
51. *Achnanthidium flexellum*
 Breb.
52. *Achnanthes longipes* Ag.
53. " *brevipes* Ag.
54. " *parvula* Kutz.
55. " *subsessilis* Ehr.

PLATE 13.

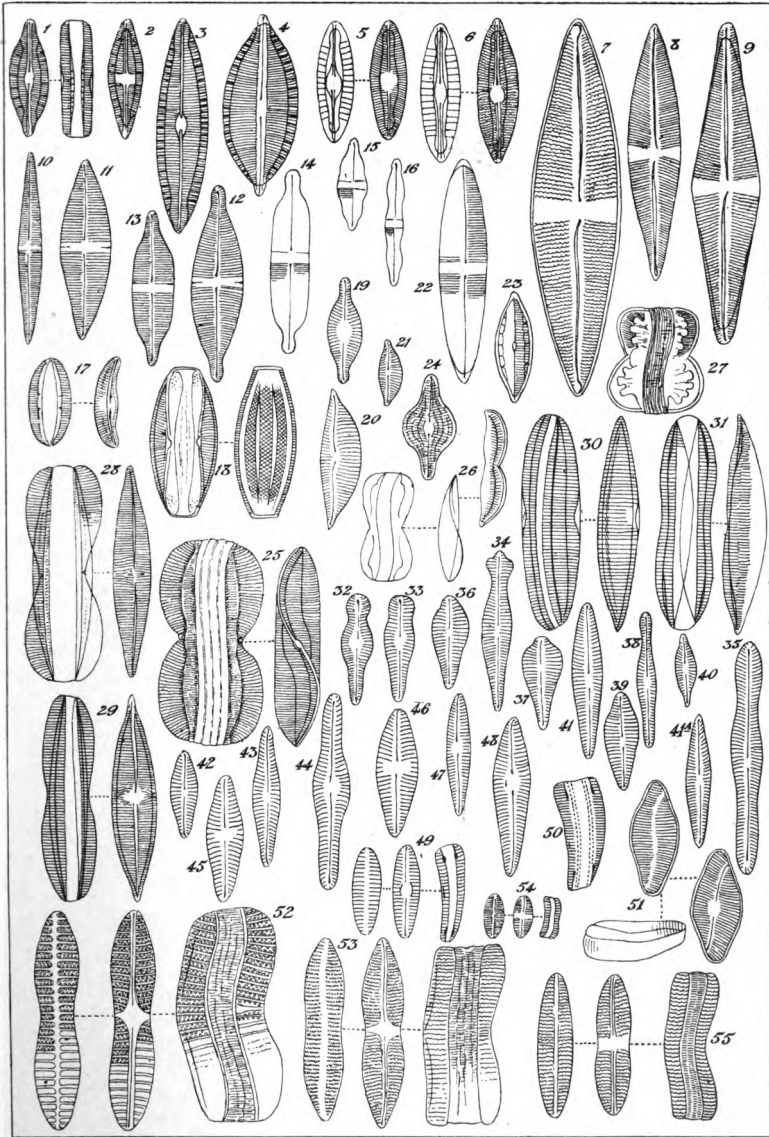


PLATE 14.

- | | |
|--------------------------------|-----------------------------------|
| 1. Achnanthescoarctata Breb. | 16. Cocconeis scutellum var |
| 2. " Hungarica Grun. | parva. |
| 3. " microcephala Kutz. | 17. Cocconeis pediculus Ehr. |
| 4. " ovalis (Greg.) V.H. | 18. " placentula Ehr. |
| 5. " exilis Kutz. | 18a. " " var |
| 6. " minutissima Kutz. | lineata. |
| 7. " linearis WSm. | 19. Cocconeis molesta var |
| 8. " trinodis Arnott) | Amygdalina. |
| Grun. | 20. Cocconeis minuta Cl. |
| 9. Achnanthes lanceolata | 21. " Helvetica Brun. |
| Breb. | 22. Epithemia turgida (Ehr.) |
| 10. Achnanthes lanceolata var | Kutz. |
| dubia. | 23. Epithemia turgida var |
| 11. Anorthoneis excentrica | Westermanni. |
| (Donk) Grun. | 24. Epithemia turgida var |
| 12. Campyloneis Grevillei | granulata. |
| (WSm.) Grun. | 25. Epithemia Hyndmanni |
| 13. Pleuroneis costata (Greg.) | WSm. |
| Cl. | 26. Epithemia Sorex Kutz. |
| 14. Cocconeis scutellum Ehr. | 27. " gibba Kutz. |
| 15. " " var | 28. " " var ventri- |
| stauroneiformis. | cosa. |

PLATE 14.

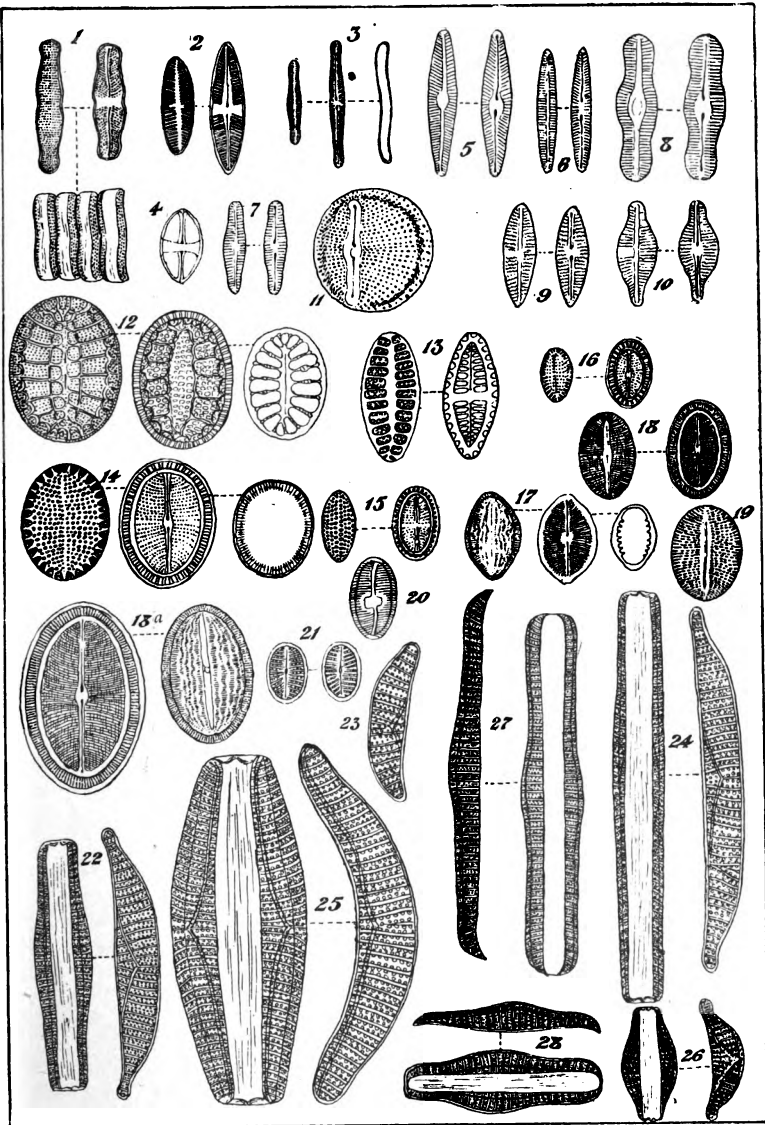


PLATE 15.

1. *Epithemia Argus* Kutz.
2. " " " var *longicornis*.
3. *Epithemia Argus* var *amphicephala*.
4. *Epithemia Zebra* (Ehr.) Kutz.
5. † *Epithemia Zebra* var *ventricosa*.
6. *Epithemia Zebra* var *proboscidea* Grun.
7. *Epithemia Musculus* Kutz
8. " " " var *constricta*.
9. *Epithemia gibberula* var *rupestris*.
10. *Epithemia ocellata* Kutz.
11. *Eunotia Arcus* Ehr.
12. " " " var *bidens*.
13. " " " var *major* (WSm.) Rab.
14. " " " var *gracilis* (Ehr.) Rab.
15. " " " var *exigua* Breb.
16. " " " var *pectinalis* (Kutz) Rab.
17. " " " var *pectinalis* var *undulata* Ralfs.
18. " " " var *praerupta* Ehr.
19. " " " var *robusta* var *tetraodon*
20. " " " var *lunaris* (Ehr.) Grun.
21. *Synedra pulchella* Kutz.
22. *Synedra pulchella* var *Smithii* Ralfs.
23. " " " var *pulchella* var *lanceolata* O'Meara.
24. " " " var *Vaucheriae* Kutz.
25. " " " var *deformis* (WSm).
26. " " " var *ulna* var *longissima*.
27. " " " var *splendens*.
28. " " " var *obtusa*.
29. " " " var *oxyrhyncus*
30. " " " var *vitrea*.
31. " " " var *Acus* (Kutz) Grun.
32. " " " var *delicatissima*
33. " " " var *radians* (Kutz) Grun.
34. " " " var *Gallionii* Ehr.
35. " " " var *capitata* Ehr.
36. " " " var *amphicephala* Kutz.
37. " " " var *affinis* Kutz.
38. " " " var *gracilis*.
39. " " " var *tabulata*.
40. " " " var *hamata*.
41. " " " var *fasciculata*.
42. " " " var *fulgens* (Kutz) WSm.
43. " " " var *superba* Kutz.
44. " " " var *baculus* Greg.
45. *Asterionella formosa* Hass.
46. " " " var *Bleakeleyi*.
47. *Asterionella formosa* var *Ralfsii*.

PLATE 15.

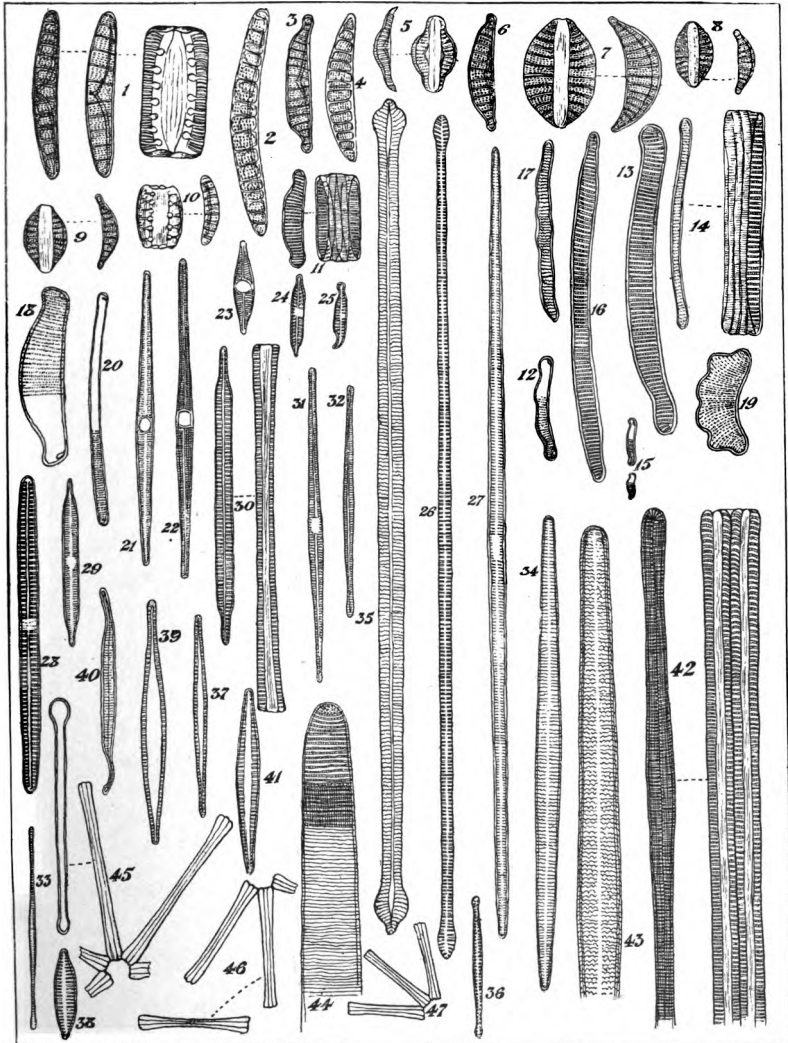


PLATE 16.

- | | |
|---------------------------------------|--|
| 1. <i>Pinnularia nobilis</i> Ehr. | 30. <i>Navicula cryptocephala</i> |
| 2. ,, <i>major</i> Kutz. | Kutz. |
| 3. ,, <i>viridis</i> Kutz. | 31. <i>Navicula rhyncocephala</i> |
| 4. ,, ,, var <i>com-</i> | Kutz. |
| <i>mutata</i> . | 32. <i>Navicula gregaria</i> Donk. |
| 5. <i>Pinnularia cardinalis</i> Ehr. | 33. ,, <i>Hungarica</i> var |
| 6. ,, <i>gracillima</i> Greg. | <i>capitata</i> . |
| 7. ,, <i>undulata</i> Greg. | 34. <i>Navicula nana</i> Greg. |
| 8. ,, <i>borealis</i> Ehr. | 35. ,, <i>cancellata</i> Donk. |
| 9. ,, <i>divergens</i> WSm. | 36. ,, <i>fortis</i> Greg. |
| 10. ,, <i>retusa</i> Breb. | 37. ,, <i>digito - radiata</i> |
| 11. ,, <i>Breissonii</i> Kutz. | var <i>Cyprinus</i> . |
| 12. ,, <i>stauroptera</i> Grun. | 38. <i>Navicula Reinhardtii</i> Grun. |
| 13. ,, <i>Tabellaria</i> Ehr. | 39. ,, <i>distans</i> (WSm) |
| 14. ,, <i>gibba</i> Kutz. | V.H. |
| 15. ,, <i>subcapitata</i> Greg. | 40. <i>Navicula arenaria</i> Donk. |
| 16. ,, <i>globiceps</i> Greg. | 41. ,, <i>lanceolata</i> Kutz. |
| 17. ,, <i>mesolepta</i> Ehr. | 42. ,, <i>Gastrum</i> (Ehr) |
| 18. ,, <i>nodosa</i> Ehr. | Donk. |
| 19. ,, ,, var <i>formica</i> . | 43. <i>Navicula Gastrum</i> var |
| 20. ,, <i>interrupta</i> WSm. | <i>exigua</i> . |
| 21. ,, <i>clavculus</i> Greg. | 44. <i>Navicula Anglica</i> Ralfs. |
| 22. <i>Navicula oblonga</i> Kutz. | 45. ,, ,, var <i>sub-</i> |
| 23. ,, <i>peregrina</i> Ehr. | <i>salina</i> . |
| 24. ,, <i>gracilis</i> Ehr. | 46. <i>Navicula semen</i> Ehr, |
| 25. ,, ,, var <i>schiz-</i> | 47. ,, <i>dicephala</i> WSm. |
| <i>zonemoides</i> . | 48. ,, <i>crucifera</i> Grun. |
| 26. <i>Navicula viridula</i> Kutz. | 49. ,, <i>directa</i> WSm. |
| 27. ,, ,, var <i>Sles-</i> | 50. ,, <i>Crabro</i> var <i>Pan-</i> |
| <i>vicensis</i> . | <i>dura</i> Breb. |
| 28. <i>Navicula radiosa</i> Kutz. | 51. <i>Navicula didyma</i> Ehr. |
| 29. ,, ,, var <i>tenella</i> | 52. ,, <i>Bombus</i> Ehr. |
| Greg. | 53. ,, <i>litoralis</i> Donk. |

PLATE 16.

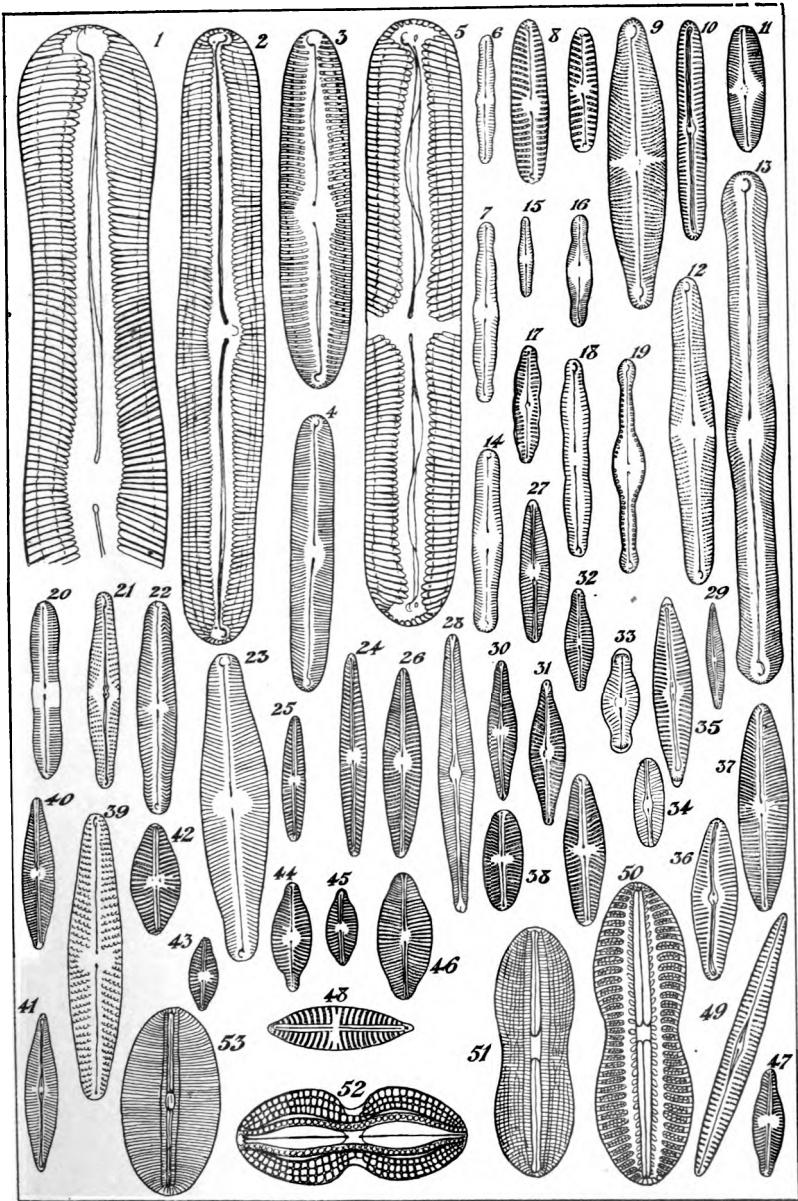


PLATE 17.

- | | |
|--|---|
| 1. <i>Navicula Smithii</i> Breb. | 23. <i>Navicula mutica</i> var <i>quin-</i> |
| 2. " " " var <i>aestiva</i> | <i>quenodis</i> . |
| Donk. | 24. <i>Schizonema crucigerum</i> |
| 3. " <i>elliptica</i> Kutz. | WSm. |
| 3a. " " " var <i>ovalis</i> . | 25. <i>Navicula integra</i> WSm. |
| 4. <i>Pinnularia appendiculata</i> | 26. " <i>palpebralis</i> Breb. |
| Ag. | 27. " " " var <i>Bark-</i> |
| 5. <i>Navicula peregrina</i> var | <i>layana</i> . |
| <i>Menisculus</i> . | 28. " <i>brevis</i> Greg. |
| 6. " <i>cincta</i> (Ehr) Kutz. | 29. " <i>elegans</i> WSm. |
| 7. " <i>rhyncocephala</i> var | 30. " <i>humerosa</i> Breb. |
| <i>rostellata</i> . | 31. " <i>scutelloides</i> WSm. |
| 8. " <i>Hungarica</i> Grun. | 32. " <i>granulata</i> Breb. |
| 9. " <i>interrupta</i> Kutz. | 33. " <i>Baileyana</i> Grun. |
| 10. " <i>nitescens</i> Greg. | 34. " <i>pusilla</i> WSm. |
| 11. " <i>fusca</i> Greg. | 35. " <i>marina</i> Ralfs. |
| 12. " <i>suborbicularis</i> Greg. | 36. " <i>scopulorum</i> Breb. |
| 13. " " " var <i>cof-</i> | 37. " <i>cuspidata</i> Kutz. |
| <i>feaeformis</i> . | 38. " <i>ambigua</i> Ehr. |
| 14. " <i>Lyra</i> Ehr. | 39. " " " forma <i>cra-</i> |
| 15. " " " var <i>elliptica</i> . | <i>ticula</i> . |
| 16. " <i>forcipata</i> Grev. | 40. " <i>fusiformis</i> var <i>ost-</i> |
| 17. " <i>pygmaea</i> Kutz. | <i>rearia</i> . |
| 18. " <i>Hennedyii</i> WSm. | 41. " <i>sculpta</i> Ehr. |
| 19. " <i>aspera</i> Ehr. | 42. " <i>Bohemica</i> Ehr. |
| 20. " <i>Tuscula</i> Ehr. | 43. " <i>sphaerophora</i> Kutz. |
| 21. " <i>mutica</i> Kutz. | 44. " <i>probabilis</i> A.S. |
| 22. " " " var <i>undulata</i> . | 45. " <i>latiuscula</i> Kutz. |
| Greg. | 46. " <i>serians</i> Breb. |

PLATE 17.

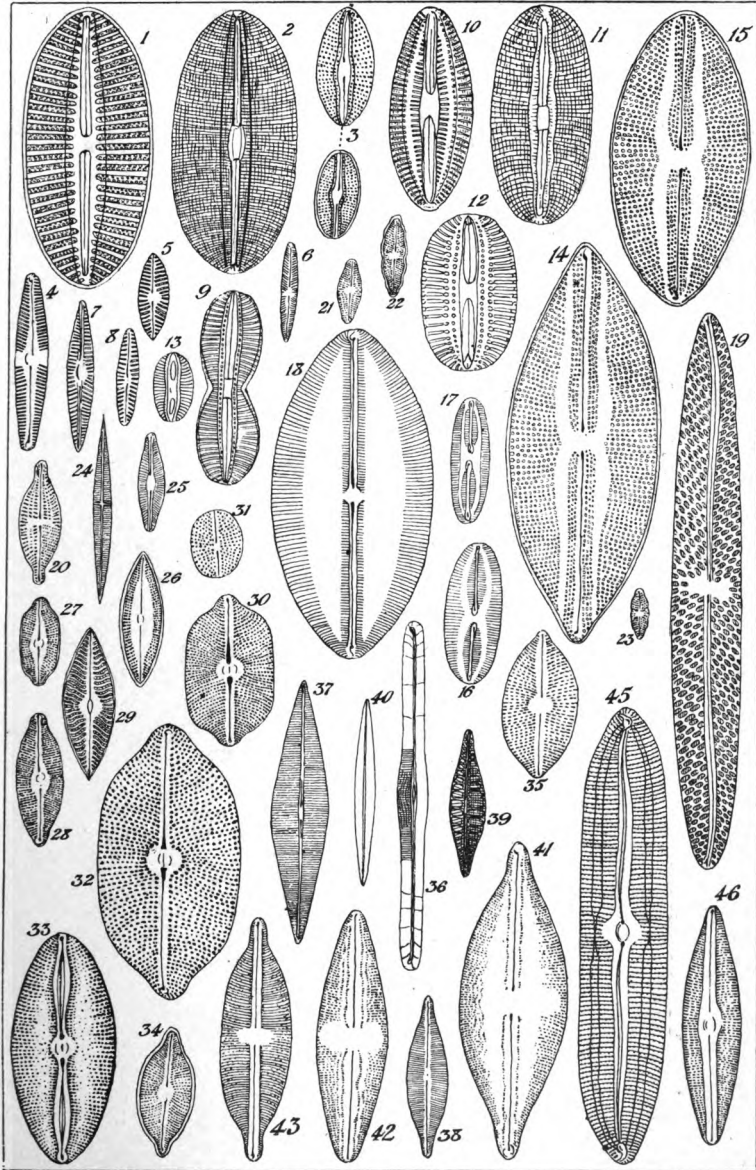


PLATE 18.

1. *Navicula amphisbaena* Bory.
2. *Navicula amphisbaena* var *subsalina*.
3. *Navicula limosa* Kutz.
4. " " *vargibberula*
5. " *bisulcata* Langst.
6. " *Iridis* Ehr.
7. " " var *amphigomphus*.
8. *Navicula Iridis* var *amphirhyncus*.
9. *Navicula Iridis* var *dubia*.
10. " " *varundulata*.
11. " " *var affinis*.
12. " *Liber* WSm.
13. " *Bacillum* WSm.
14. " *laevissima* Kutz.
15. " *obtusa* WSm.
16. " *atomus* Naeg.
17. " *cocconeiformis* Greg.
18. " *binodis* (Ehr.) WSm.
19. " *lepidula* Grun.
20. *Mastogloia Gallica* WSm.
21. *Schizonema Smithii* Ag.
22. *Navicula crucicula* Donk.
23. *Schizonema Grevillei* Ag.
24. " *ramosissimum* Ag.
25. *Vanheurckia rhomboides* (Ehr.) Breb.
26. *Vanheurckia rhomboides* var *Saxonica* Rab.
27. *Vanheurckia vulgaris* (Thw.), V.H.
28. *Amphipleura pellucida* Kutz.
29. *Brebissonia Boeckii* (WSm) Grun.
30. *Berkeleya fragilis* Grev.
31. " *obtusa* Grev.
32. *Scoliopleura latestriata* (Breb.) Grun.
33. *Scoliopleura tumida* (Breb) Rab.
34. *Scoliopleura Westii* (WSm) Grun.
35. *Pleurosigma speciosum* WSm.
36. *Pleurosigma Balticum* var *Wansbeckii*.
37. *Pleurosigma Spencerii* var *curvula* Grun.
38. *Cocconeis distans* (Greg.) Grun.
39. *Rhizosolenia calcar-avis* Schul.
40. *Rhizosolenia robusta* Norm

PLATE 18.

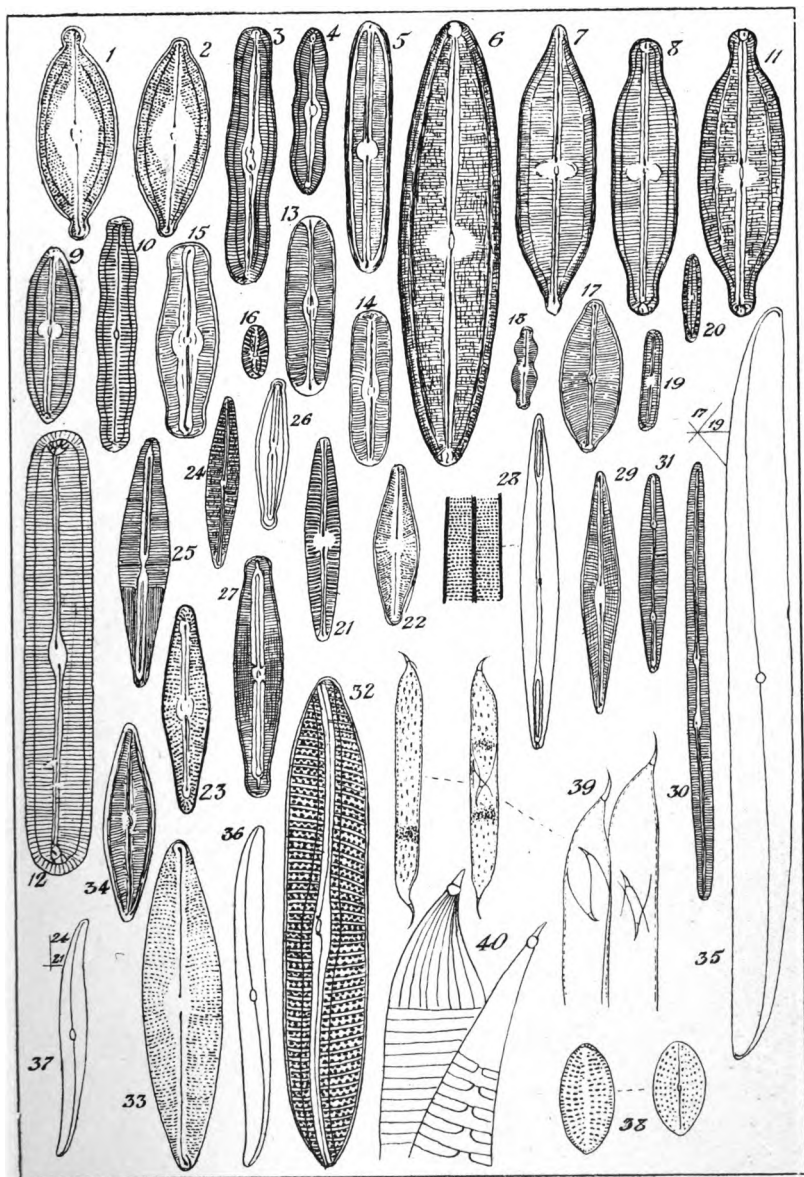


PLATE 19.

- | | |
|---|---|
| 1. <i>Pleurosigma angulatum</i>
WSm. | 17. <i>Pleurosigma attenuatum</i>
var <i>scalprum</i> (Gaill)
Grun. |
| 2. <i>Pleurosigma Aestuarii</i>
WSm. | 18. <i>Pleurosigma litorale</i> WSm |
| 3. <i>Pleurosigma quadratum</i>
WSm. | 19. „ <i>Balticum</i> WSm. |
| 4. <i>Pleurosigma delicatum</i>
WSm. | 20. „ „ var <i>Brebi-</i>
<i>ssonii</i> . |
| 5. <i>Pleurosigma strigosum</i>
WSm. | 21. <i>Pleurosigma acuminatum</i>
(Kutz) Grun. |
| 6. <i>Pleurosigma rigidum</i> WSm | 22. <i>Pleurosigma strigilis</i> WSm |
| 7. „ <i>affine</i> var <i>Normanii</i> | 23. „ <i>Spencerii</i> var
<i>Smithii</i> Grun. |
| 8.† „ <i>Nicobaricum</i> Grun | 24. „ <i>tenuissimum</i> WSm |
| 9. „ <i>lanceolatum</i> Donk | 25. „ <i>Parkerii</i> . Harr. |
| 10. „ <i>intermedium</i> WSm | 26. „ <i>distortum</i> WSm. |
| 11. „ „ var
<i>nubecula</i> . | 27. „ <i>Fasciola</i> WSm. |
| 12. „ <i>elongatum</i> WSm. | 28. „ „ var
<i>prolongatum</i> . |
| 13. „ <i>acutum</i> Norm. | 29.† <i>Pleurosigma tenuissimum</i>
var <i>hyperborea</i> Grun. |
| 14. „ <i>decorum</i> WSm. | 30. <i>Pleurosigma eximium</i>
(Thw) VH. |
| 15. „ <i>Hippocampus</i>
WSm. | 31. <i>Toxonidea insignis</i> Donk. |
| 16. <i>Pleurosigma attenuatum</i>
WSm. | 32. „ <i>undulata</i> Norm. |

NOTE.—The Diagram on the right of each figure indicates the number of striae in 1 μ (0.01 mm).

PLATE 19.

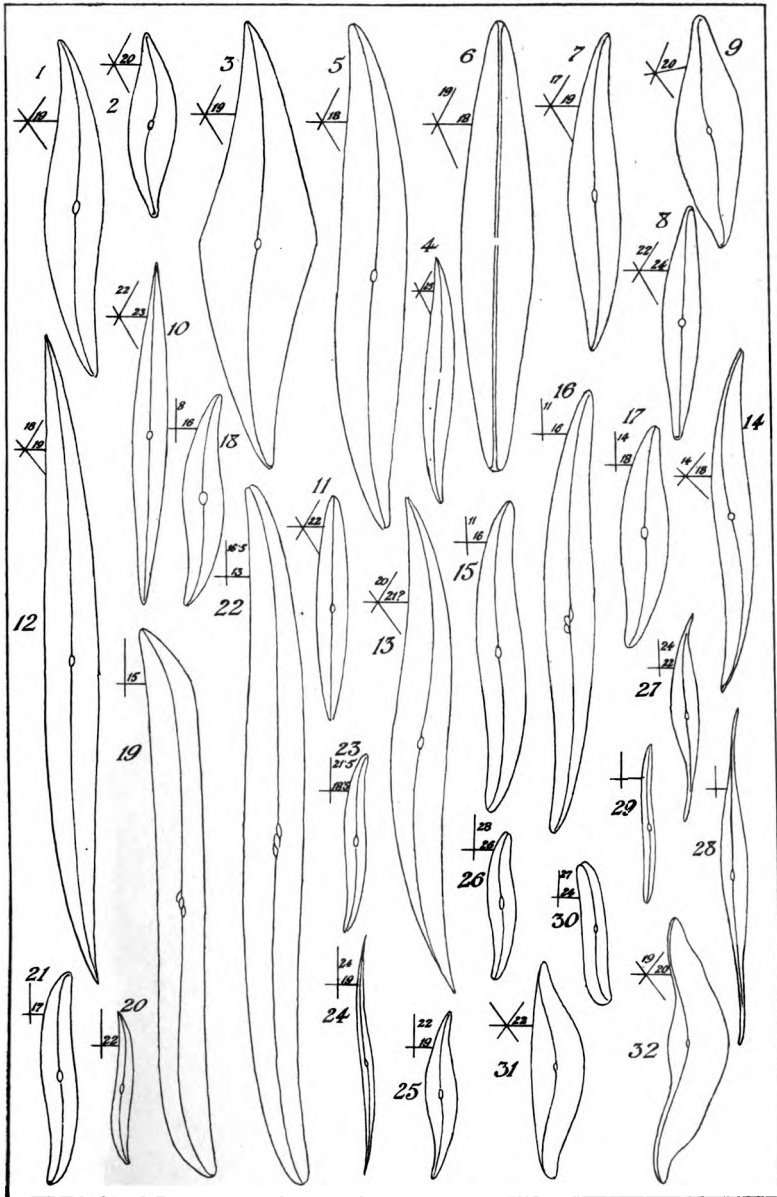


PLATE 20.

- | | |
|--|---|
| 1. <i>Fragilaria virescens</i> Balfs. | 23. <i>Meridion circulare</i> var <i>constrictum</i> . |
| 2. „ <i>undata</i> WSm. | 24. „ <i>circulare</i> var <i>Zinkenii</i> Kutz. |
| 3.† „ „ var <i>constricta</i> . | 25. <i>Diatoma vulgare</i> Bory. |
| 4.† „ <i>parasitica</i> var <i>trigona</i> . | 26. „ <i>elongatum</i> Ag. |
| 5. „ <i>striatula</i> Lyngb. | 27. „ „ var <i>Ehrenbergii</i> . |
| 6. „ <i>hyalina</i> (Kutz)Grun. | 28. „ <i>hiemale</i> (Lyng)Heib. |
| 7. „ <i>capucina</i> Desm. | 29. „ <i>vulgare</i> Bory. |
| 8. „ „ var <i>mesolepta</i> . | 30. <i>Denticula tenuis</i> Kutz. |
| 9. „ <i>construens</i> (Ehr)Grun. | 31. „ „ var <i>inflata</i> . |
| 10. „ <i>construens</i> var <i>binodis</i> . | 32. „ „ „ <i>frigida</i> . |
| 11. „ <i>tenuicollis</i> var <i>intermedia</i> . | 33. <i>Grammatophora marina</i> (Lyng) Kutz. |
| 12. „ <i>Harrisonii</i> (WSm)Grun. | 34. <i>Grammatophora marina</i> var <i>macilenta</i> . |
| 13. „ <i>mutabilis</i> (WSm)Grun. | 35. <i>Grammatophora</i> <i>serpentina</i> (Ralfs) Ehr. |
| 14. <i>Campylosiracymbelliformis</i> (A.S.) Grun. | 37. <i>Tabellaria fenestrata</i> (Lyng) Kutz. |
| 15. <i>Raphoneis amphiceros</i> Ehr. | 38. <i>Tabellaria flocculosa</i> (Roth) Kutz. |
| 16. „ <i>Belgica</i> Grun. | 39. <i>Rhabdonema Adriaticum</i> Kutz. |
| 17. <i>Plagiogramma Gregorianum</i> Grev. | 40. <i>Rhabdonema arcuatum</i> (Ag) Kutz. |
| 18. <i>Licmophora Dalmatica</i> var <i>tenella</i> . | 41. <i>Rhabdonema minutum</i> Kutz. |
| 19. <i>Licmophora Anglica</i> (Kutz) Grun. | 42.† <i>Triceratium pentacrinus</i> Wallach. |
| 20. <i>Licmophora paradoxa</i> (Lyng) Ag. | 43. <i>Rhizosolenia styliformis</i> Bright. |
| 21. <i>Licmophora communis</i> (Heib) Grun. | 44. <i>Rhizosolenia imbricata</i> Bright. |
| 22. <i>Meridion circulare</i> Ag. | |

PLATE 20.

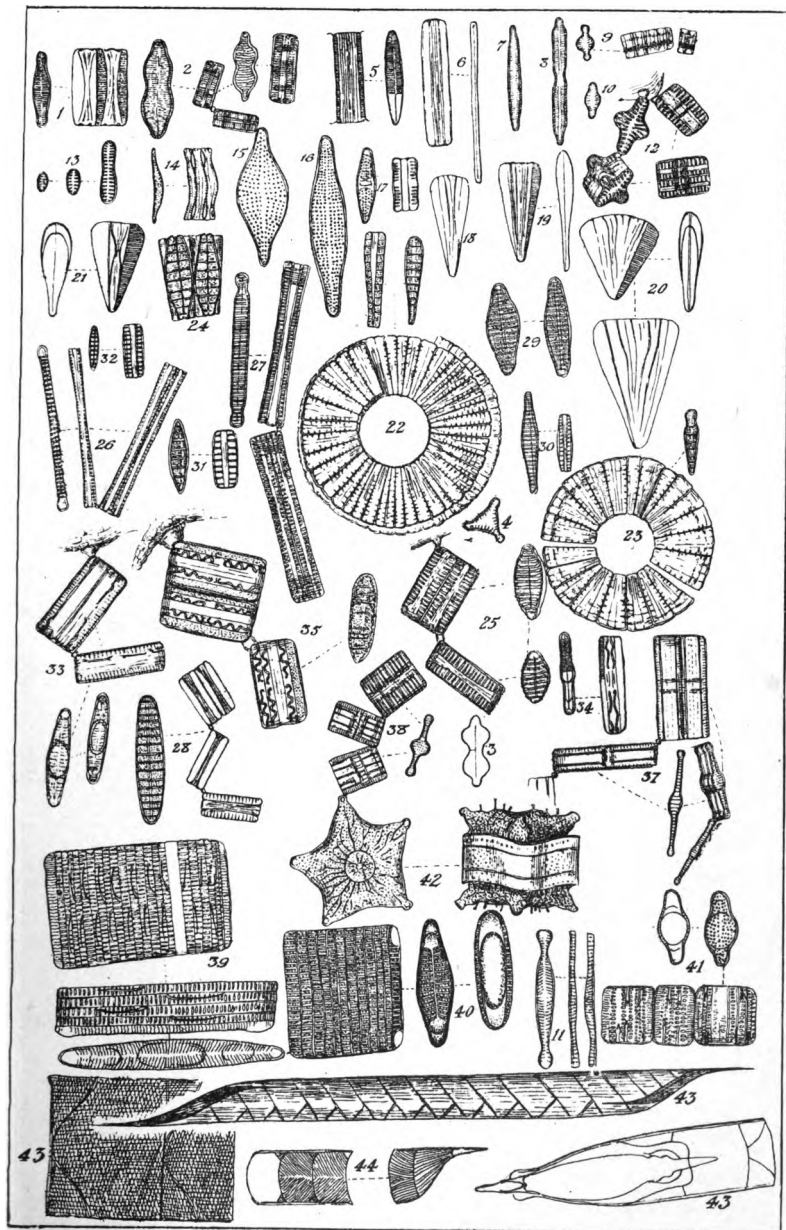


PLATE 21.

- | | |
|--|---|
| 1. <i>Cymatopleura elliptica</i>
(Breb) WSm. | 20. <i>Surirella ovalis</i> var <i>ovata</i>
Kutz. |
| 2. „ <i>elliptica</i> var
<i>Hibernica</i> . | 21. „ <i>ovalis</i> var <i>minuta</i>
Breb. |
| 3. „ <i>Solea</i> (Breb) WSm. | 22. „ <i>ovalis</i> var <i>salina</i>
WSm. |
| 4. „ „ var <i>apiculata</i> . | 23. „ <i>ovalis</i> var <i>angusta</i>
Kutz. |
| 5. <i>Surirella biseriata</i> Breb. | 24. „ <i>ovalis</i> var <i>apiculata</i> . |
| 6. „ <i>linearis</i> WSm. | 25. „ „ „ <i>panduri-</i>
<i>formis</i> WSm. |
| 7. „ <i>constricta</i> . | 26. „ <i>ovalis</i> var <i>pinnata</i>
WSm. |
| 8. „ <i>elegans</i> Ehr. | 27. „ <i>fluminensis</i> Grun. |
| 9. „ <i>subsalsa</i> WSm. | 28. „ <i>spiralis</i> Kutz. |
| 10. „ <i>robusta</i> Ehr. | 29. <i>Campylodiscus Hodgsonii</i> .
WSm. |
| 11. „ „ var <i>splendida</i> . | 30. <i>Campylodiscus decorus</i>
Breb. |
| 12. „ „ „ <i>tenera</i> . | 31. <i>Campylodiscus parvulus</i>
WSm. |
| 13. „ <i>striatula</i> Turp. | 32. <i>Campylodiscus Echineis</i>
Ehr. |
| 14. „ <i>gemma</i> Ehr. | |
| 15. „ <i>fastuosa</i> Ehr. | |
| 16. „ <i>turgida</i> WSm. | |
| 17. „ <i>ovalis</i> Breb. | |
| 18. „ „ var <i>Crumena</i>
Breb. | |
| 19. „ <i>ovalis</i> var <i>Bright-</i>
<i>wellii</i> WSm. | |

PLATE 21.

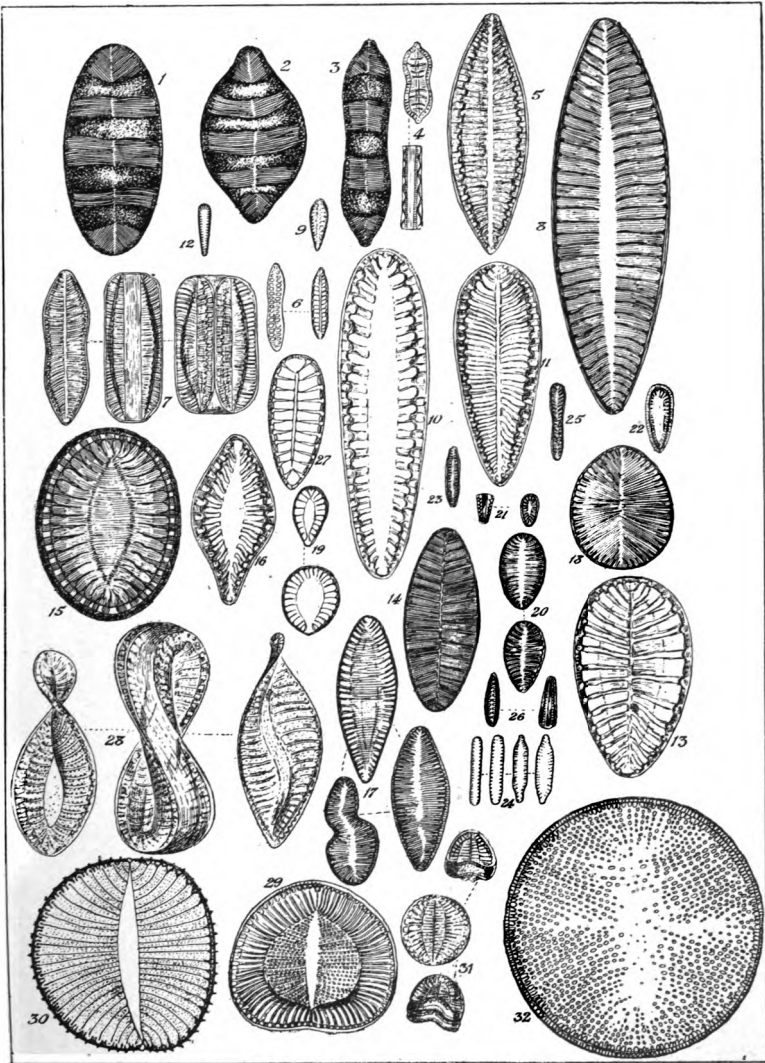


PLATE 22.

- | | |
|-------------------------------------|---------------------------------------|
| 1. <i>Campylodiscus clypeus</i> Ehr | 8. <i>Biddulphiagranulata</i> Roper |
| 2. ,, <i>Thuretii</i> Breb. | 9. ,, <i>turgida</i> WSm. |
| 3. ,, <i>Hibernicus</i> Ehr. | 10. <i>Cerataulus Smithii</i> (Ralfs) |
| 4. <i>Biddulphia aurita</i> (Lyng) | VH. |
| Breb. | 11. <i>Amphitetras antediluviana</i> |
| 5. <i>Biddulphia Rhombus</i> (Ehr) | (Ehr). |
| WSm. | 12. <i>Triceratium favus</i> Ehr. |
| 6. <i>Biddulphia Rhombus</i> var | 13. ,, <i>alternans</i> Bail. |
| <i>trigona</i> Cl. | 14. ,, <i>armatum</i> Roper. |
| 7. <i>Biddulphia Baileyi</i> WSm. | 15. ,, <i>variabile</i> Bright. |
| | 16. <i>Eucampia Zodiacus</i> Ehr. |

PLATE 22.

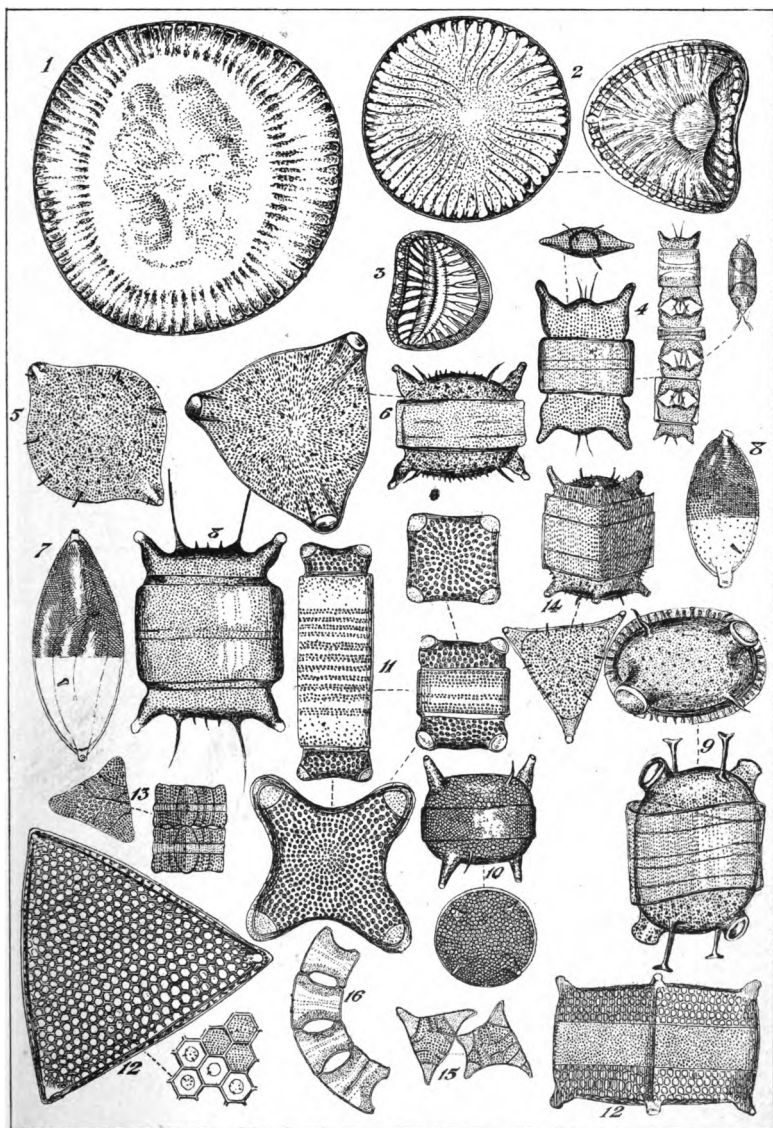


PLATE 23.

1. *Hantzschia amphioxys* (Ehr) Grun.
2. *Hantzschia virgata* (Roper) Grun.
3. *Hantzschia marina* (Donk) Grun.
4. *Nitzschia navicularis* (Breb) Grun.
5. *Nitzschia punctata* (WSm) Grun.
6. *Nitzschia Tryblionella* Hantz.
7. *Nitzschia Tryblionella* var *maxima* Grun.
8. *Nitzschia Tryblionella* var *Levidensis*.
9. *Nitzschia debilis* (Arnott) Grun.
10. *Nitzschia angustata* (WSm)
11. „ *constricta* (Greg) Grun
12. „ *plana* (W8m).
13. „ *Hungarica* Grun.
14. „ *apiculata* (Greg) Grun.
15. „ *acuminata* (WSm) Grun.
16. *Nitzschia circumsuta* (Bail) Grun.
17. *Nitzschia dubia* WSm.
18. „ *commutata* Grun.
19. *Nitzschia bilobata* WSm.
20. „ *sinuata* (WSm) Grun
21. „ *scalaris* WSm.
22. „ *insignis* Greg.
23. „ *paradoxa* (Gmel) Grun.
24. *Nitzschia vivax* WSm.
25. „ *angularis* WSm.
26. „ *spathulata* Breb.
27. *Nitzschia cursoria* (Donk) Grun.
28. *Nitzschia dissipata* (Kutz) Grun.
29. *Nitzschia sigmoidea* (Ehr) WSm.
30. *Nitzschia vermicularis* (Kutz) Grun.
31. *Nitzschia Brebissonii* WSm.
- 31a. *Nitzschia Sigma* WSm.
32. „ „ var *intercedens* Grun.
33. *Nitzschia Sigma* var *rigida* (Kutz) Grun.
34. *Nitzschia Sigma* var *rigidula* Grun.
35. *Nitzschia Sigma* var *sigmatella* Grun.
36. *Nitzschia fasciculata* Grun.

PLATE 23.

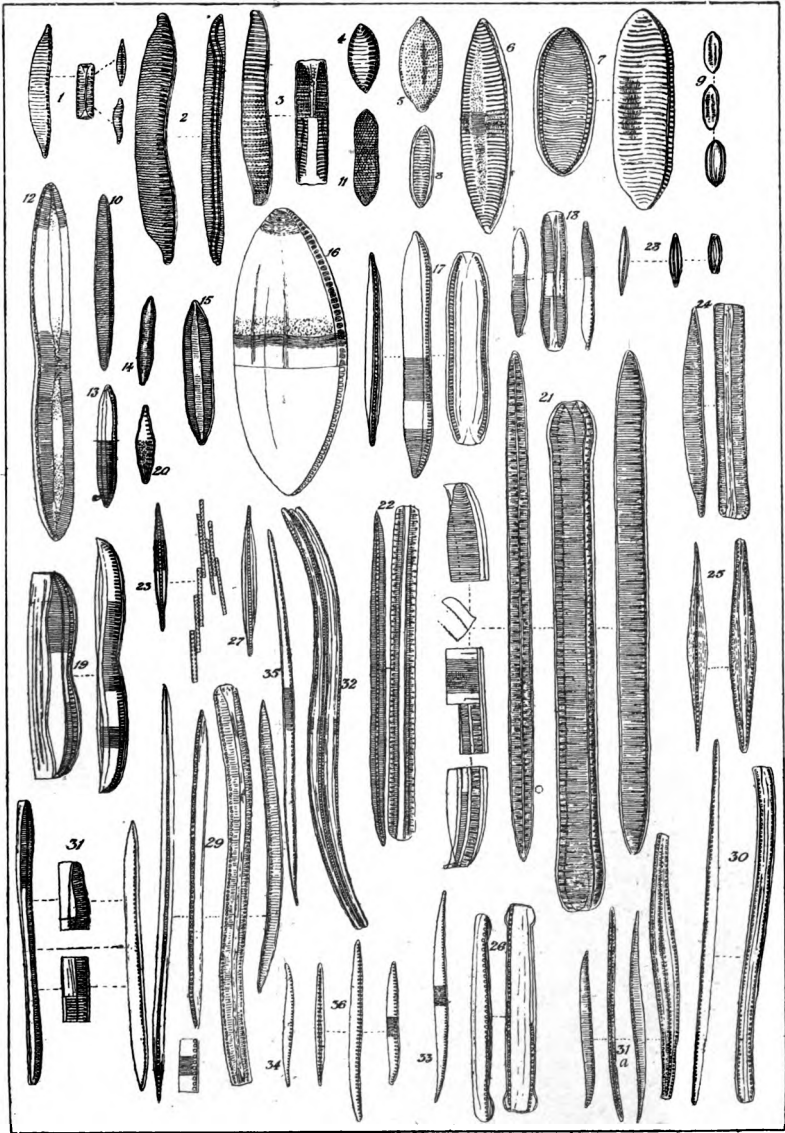


PLATE 24.

- | | |
|---|--|
| 1. <i>Nitzschia obtusa</i> var <i>scalpelliformis</i> Grun. | 19. <i>Chaetoceros armatus</i> West. |
| 2. „ <i>spectabilis</i> (Ehr) Ralfs. | 20. „ <i>Danicus</i> Cl. |
| 3. „ <i>linearis</i> (Ag) WSm. | 21. „ <i>Lorenzianus</i> Grun. |
| 4. „ „ var <i>tenuis</i> WSm. | 22. „ <i>borealis</i> Bail. |
| 5. „ <i>vitrea</i> Norm. | 23. „ <i>Peruvianus</i> Bright. |
| 6. „ <i>lanceolata</i> WSm. | 24. <i>Bacteriastrum varians</i> Lauder. |
| 7. „ „ <i>forma minor</i> . | 25. <i>Ditylum Brightwellii</i> (West) Grun. |
| 8. „ <i>Palea</i> (Kutz) WSm. | 26. <i>Chaetoceras Lorenzianus</i> , endocysts of. |
| 9. „ „ var <i>tenuirostris</i> Grun. | 27. „ <i>diadema</i> , spores of. |
| 10. „ <i>communis</i> Rab. | 28. <i>Cyclotella striata</i> (Kutz) Grun. |
| 11. „ <i>amphibia</i> Grun. | 29. „ <i>antiqua</i> WSm. |
| 12.† „ <i>longissima</i> (Breb) Ralfs. | 30. „ <i>compta</i> var <i>radiosa</i> . |
| 13. „ <i>longissima</i> var <i>Closterium</i> WSm. | 31. „ <i>operculata</i> Kutz. |
| 14. „ <i>longissima</i> var <i>reversa</i> WSm. | 32. „ <i>Meneghiniana</i> Kutz. |
| 15. „ <i>longissima</i> var <i>parva</i> | 33. „ <i>Kutzingiana</i> Chauvin. |
| 16. „ <i>acicularis</i> WSm. | 34. <i>Hyalodiscus stelliger</i> Bail. |
| 17. „ <i>filiformis</i> WSm. | 35. „ <i>Scoticus</i> (Kutz) Grun. |
| 18. <i>Cylindrotheca gracilis</i> (Breb) Grun. | 36. <i>Rhizosolenia setigera</i> Bright. |
| | 37. „ <i>alata</i> Bright. |

PLATE 24.

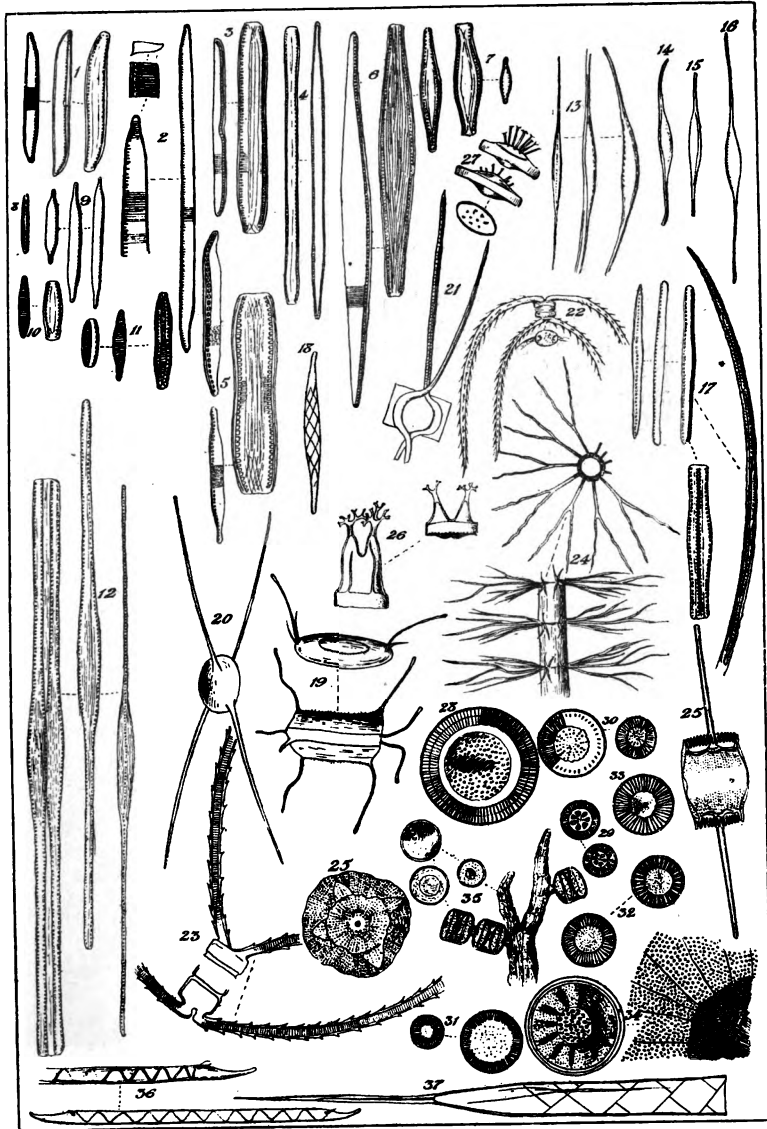


PLATE 25.

- | | |
|--------------------------------------|---|
| 1. <i>Auliscus sculptus</i> (WSm) | 17. <i>Coscinodiscus subtilis</i> var |
| 2. <i>Eupodiscus Argus</i> Ehr. | Normanii Greg. |
| 3. <i>Aulacodiscus Sollittianus</i> | 18. „ <i>lacustris</i> Grun. |
| Arnett. | 19. „ <i>labyrinthus</i> Roper. |
| 4. <i>Roperia tessellata</i> (Roper) | 20. „ <i>obscurus</i> A.S. |
| Grun. | 21. „ <i>symmetricus</i> Grev. |
| 5. <i>Actinoptychus undulatus</i> | 22. <i>Stephanopyxis Turris</i> |
| Ehr. | (Grev) Ralfs. |
| 6. „ <i>splendens</i> (Shad) | 23. <i>Skeletonema costatum</i> |
| Ralfs. | (Grev.) Cl. |
| 7. <i>Actinocyclus Ralfsii</i> WSm. | 24. <i>Melosira nummuloides</i> |
| 8. „ <i>crassus</i> (WSm) | (Bory) Ag. |
| Ralfs. | 24A. „ <i>Westii</i> WSm. |
| 9. „ <i>Roperii</i> (Breb) Kitt. | 25. „ <i>Borreri</i> Grev. |
| 10. <i>Coscinodiscus perforatus</i> | 26. „ <i>varians</i> Ag. |
| Ehr. | 27. „ <i>Jurgensii</i> Ag. |
| 11. „ <i>radiatus</i> Ehr. | 28. „ <i>Roeseana</i> Rab. |
| 12. „ <i>centralis</i> Ehr. | 29. „ <i>distans</i> var <i>nivalis</i> . |
| 13. „ <i>concinus</i> A.S. | 30. „ <i>crenulata</i> Kutz. |
| 14. „ <i>excentricus</i> Ehr. | 31. „ <i>arenaria</i> Moore. |
| 15. „ <i>decipiens</i> Grun. | 32. „ <i>granulata</i> (Ehr) |
| 16. „ <i>subtilis</i> (Ehr) Grun. | Ralfs. |
| | 33. <i>sulcata</i> (Ehr) Kutz. |

PLATE 25.

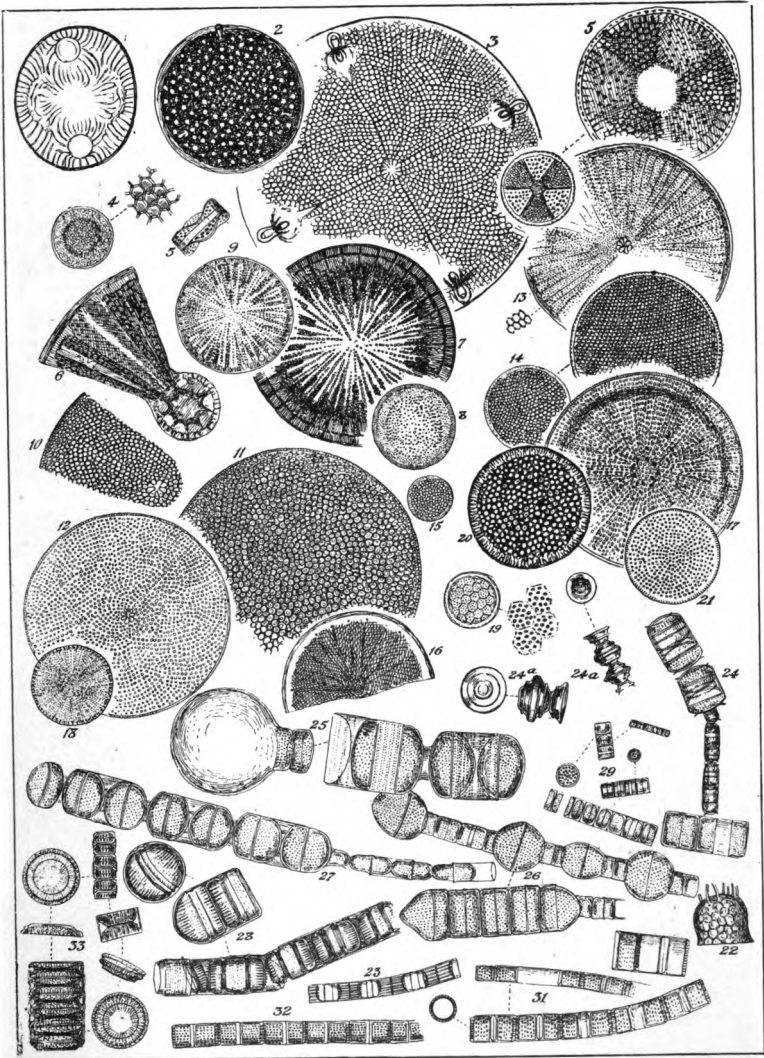


PLATE 26.

1. *Coscinodiscus oculus-iridis* Ehr.
2. *Actinocyclus Ehrenbergii* Ralfs.
3. *Navicula cryptocephala* var *exilis*.
4. *Navicula elliptica* var *oblongella*.
5. *Navicula pygmaea* Kutz.
6. *Podosira Smithiana* Grun.
7. *Stauroneis amphoroides* Grun.
8. *Asterionella formosa* var *gracillima*.
9. *Fragilaria construens* var *venter*.
10. *Grammatophora oceanica* Ehr.
11. *Surirella striatula* forma *biplicata*.
12. *Nitzschia punctata* var *elongata*.
13. *Nitzschia subcohaerens* Grun.
14. *Nitzschia obtusa* var *brevissima*.
15. *Navicula cuspidata* var *craticula*
16. *Synedra ulna* var *aequalis*.
17. *Cymbella lanceolata* forma *Boeckii* Grun.
18. *Navicula exilis* (Kutz) Grun.
19. „ *cryptocephala* var *veneta*.
20. *Navicula confervacea* Kutz.
21. „ *limosa* var *curta* Grun.
22. „ *latissima* Greg.
23. „ *incerta* Grun.
24. *Colletonema lacustre* Ag.
25. *Synedra ulna* (Nitzsch) Ehr.
26. *Eunotia robusta* Ralfs.
27. „ *Veneris* Kutz.
28. „ *monodon* Ehr.
29. „ *pectinalis* var *ventricosa*.
30. *Tetracyclus rupestris* (Braun) Grun.
31. *Pleurosigma naviculaceum* Breb.
32. *Pleurosigma macrum* WSm.
33. *Diatoma hiemale* (Lyng) Heib.
34. *Diatoma hiemale* var *mesodon*.

PLATE 26.

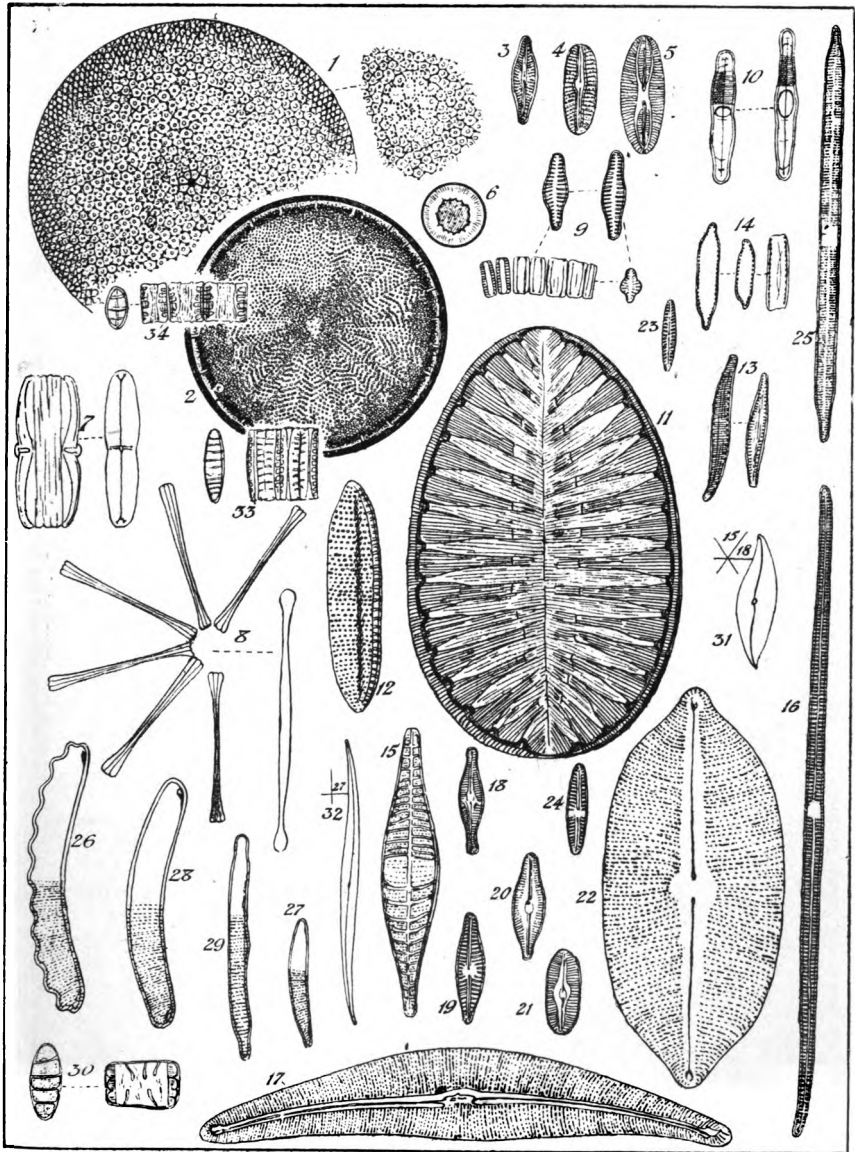


PLATE 27.

- | | |
|---|--|
| 1. <i>Pinnularia lata</i> Breb. | 8. <i>Eunotia flexuosa</i> var
<i>bicapitata</i> Grun. |
| 2. „ <i>hemiptera</i> Kutz. | 9. <i>Synedra ulna</i> var <i>amphi-</i>
<i>rhyncus</i> . |
| 3. <i>Navicula Pupula</i> Kutz. | 10. <i>Nitzschia denticula</i> Grun. |
| 4. <i>Pleurosigma scalproides</i>
Rab. | 11. „ <i>dissipata</i> var <i>media</i> . |
| 5. <i>Eunotia diodon</i> Ehr. | 12. <i>Campylodiscus Echineis</i>
var <i>cribrosus</i> . |
| 6. „ <i>lunaris</i> var <i>bilunaris</i>
(Ehr) Grun. | 13. <i>Auricula complexa</i> (Greg)
Cl. |
| 7. <i>Eunotia lunaris</i> var <i>undu-</i>
<i>lata</i> . | |

PLATE 28.

- | | |
|--|--------------------------------------|
| (a) <i>Chaetoceros Wighamii</i>
Bright. | (c) <i>Chaetoceros teres</i> Cl. |
| (b) <i>Chaetoceros didymus</i> Ehr. | (d) <i>Chaetoceros decipiens</i> Cl. |
| | (e) <i>Chaetoceros currens</i> Cl. |

PLATE 27.

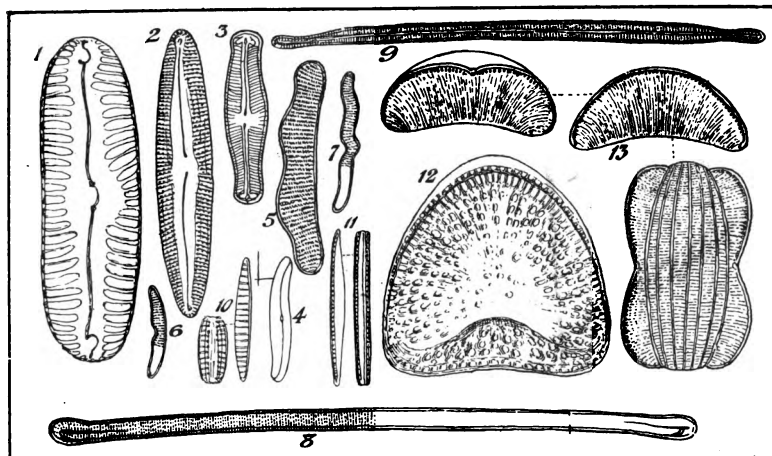
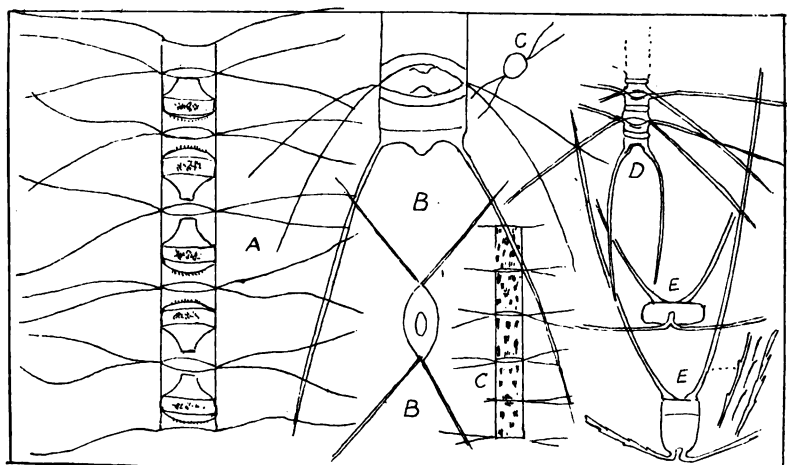


PLATE 28.



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